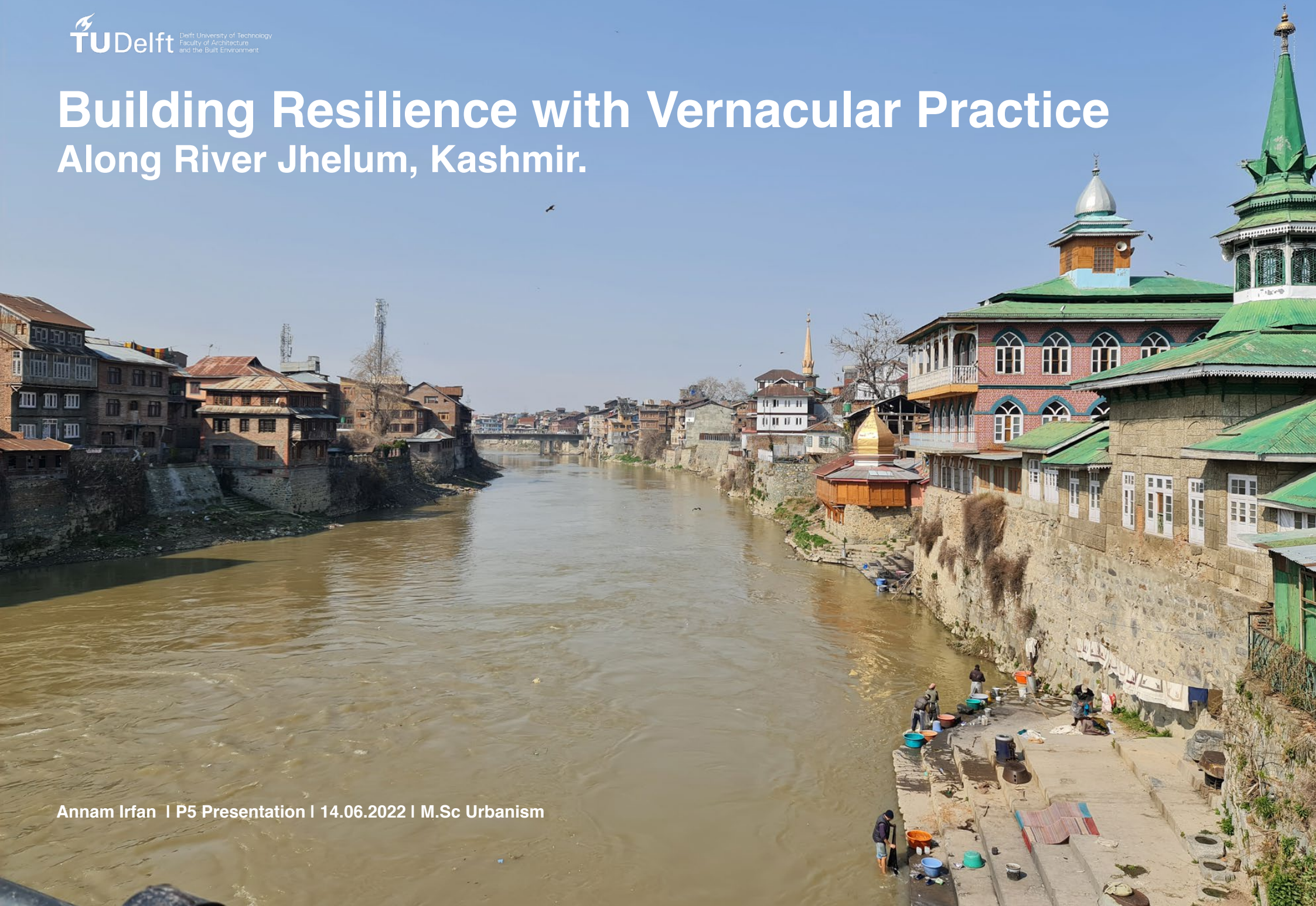
TU Delft Delft University of Technology Faculty of Architecture and the Built Environment

Building Resilience with Vernacular Practice
Along River Jhelum, Kashmir.



Annam Irfan I P5 Presentation I 14.06.2022 I M.Sc Urbanism

Outline

1. Research Lens
2. Analysis
3. Design
4. Conclusion

Research Lens

1

Jhelum 2014 Catastrophic Floods

Post Flood Master-plans

1.Srinagar Master Plan 1971

Floods of 1902.
First comprehensive flood management plan

2. Master- plan 2000

Poorly executed. Conflict Crisis

3. Master plan 2035,

- Threshold Population nearly doubles from 1.8 to 3 million
- The Srinagar Metropolitan Area increases by **84% increase.** from 416 Sq. Km to 766 Sq. Km.,

Source: Srinagar Masterplan 2035 Report

The Encroachment Issue

Problem Field

Existing Vernacular Water Culture

Jammu and Kashmir: 718 people booked for encroachment on water bodies, wetlands

A large number of wetlands and water bodies in Jammu and Kashmir has been encroached upon, posing a serious threat to biodiversity.

Regulation for flood control measures

Fig Top Left. The Floating “Raft Gardens”at Dal Lake (1881), Source: Ermens 1881 :322, Floating Economies, M. Casimir
Fig Bottom: A news headline clipping of a quote by the District Commissioner

The Boatmen of Jhelum

Vernacular Water Culture

1. Temporary Gardens, Radd

Vegetable Market, Dal Lake

2. Permanent Islands, Demb

The Haenjis engaged in...
Tourism, Transportation, Urban Farming and Commerce

Images Source: Edited from Muhammad Manan Dar

Vernacular Planning Gap

Problem Statement

Vernacular water heritage strengthen the vibrancy of Jhelum.

However the planning authorities in viewing such practices as encroachments create a planning- vernacular gap that only exacerbates vulnerability .

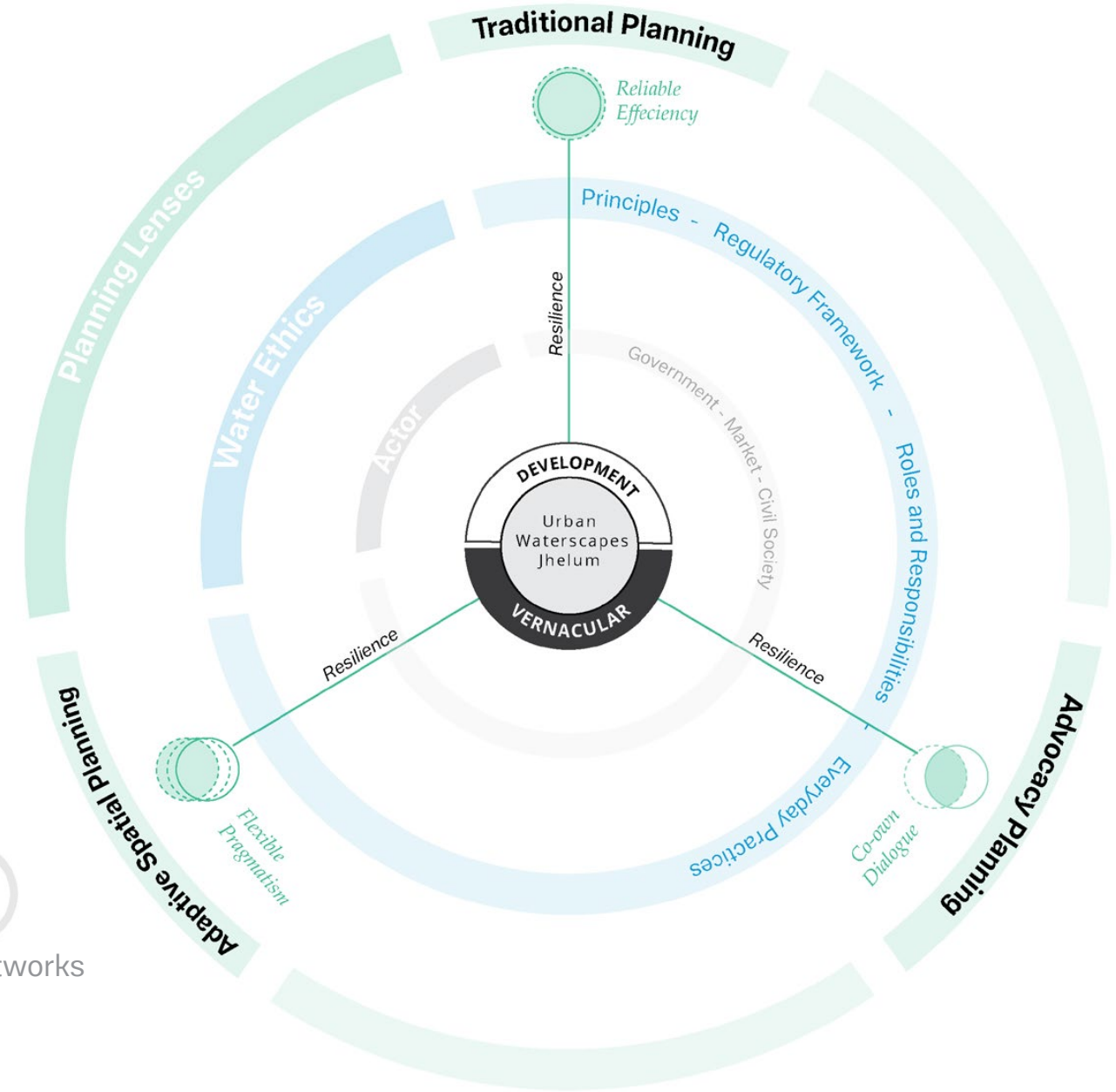
Addressing the Gap

Research Aim

Resilient design should build on the long evolved practices of vernacular and suggest adaptation through advocacy.

Conceptual Framework

Research lens



How

Planning Lens

What

Vernacular Planning Gap

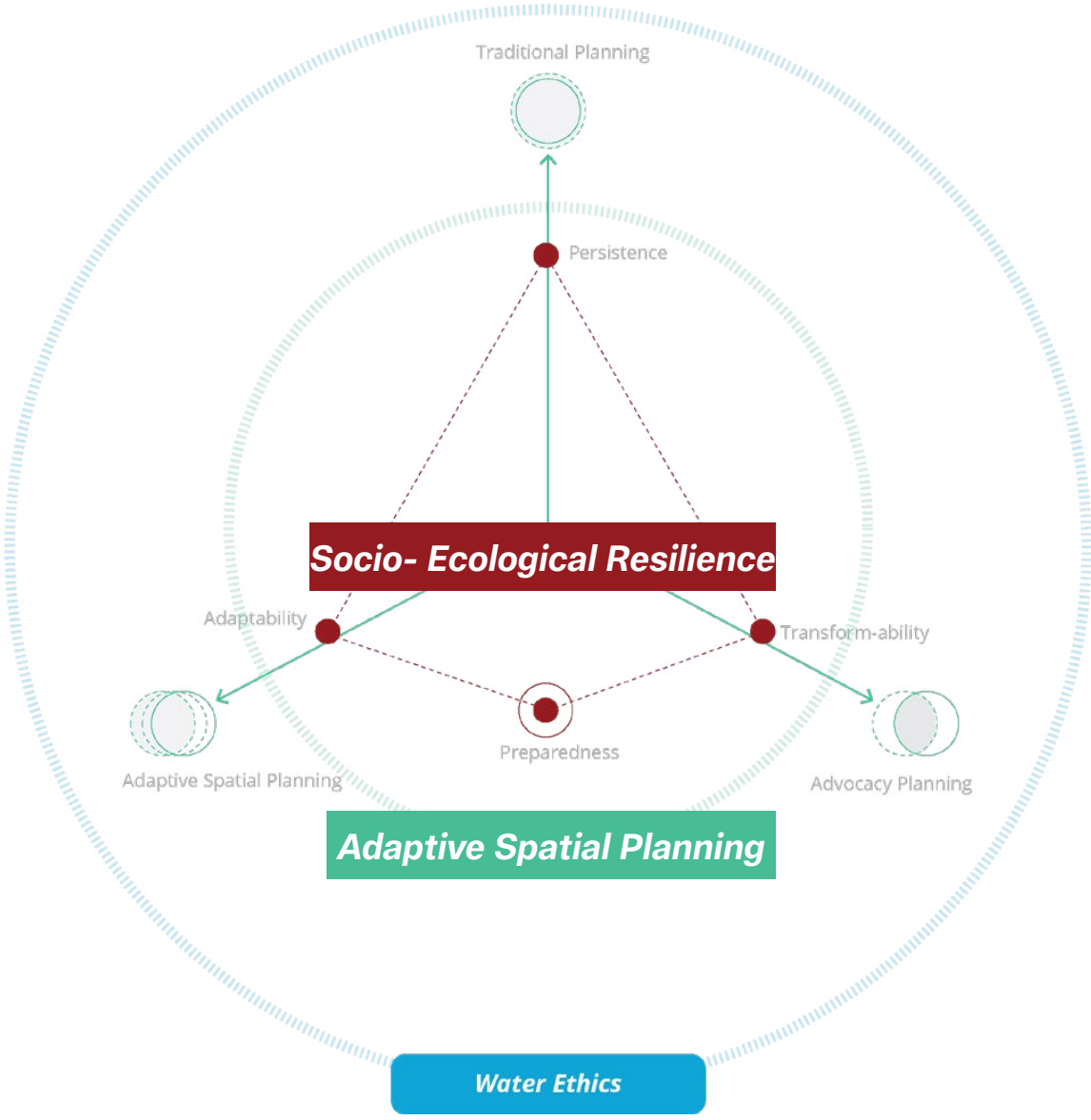
Who

Actor Networks

Theoretical Underpinnings

Research lens

Borrowing and later expanding these principles with Site Analysis



Research Question

Research lens

How can vernacular practices of River Jhelum build on adaptive spatial planning to guide resilient development of Srinagar city, Kashmir?

Sub Research Questions

Research lens

Vernacular Water Conflicts

1. What are the most urgent urbanization conflicts around water that aggravated the flooding? Why have these emerged as urgent?

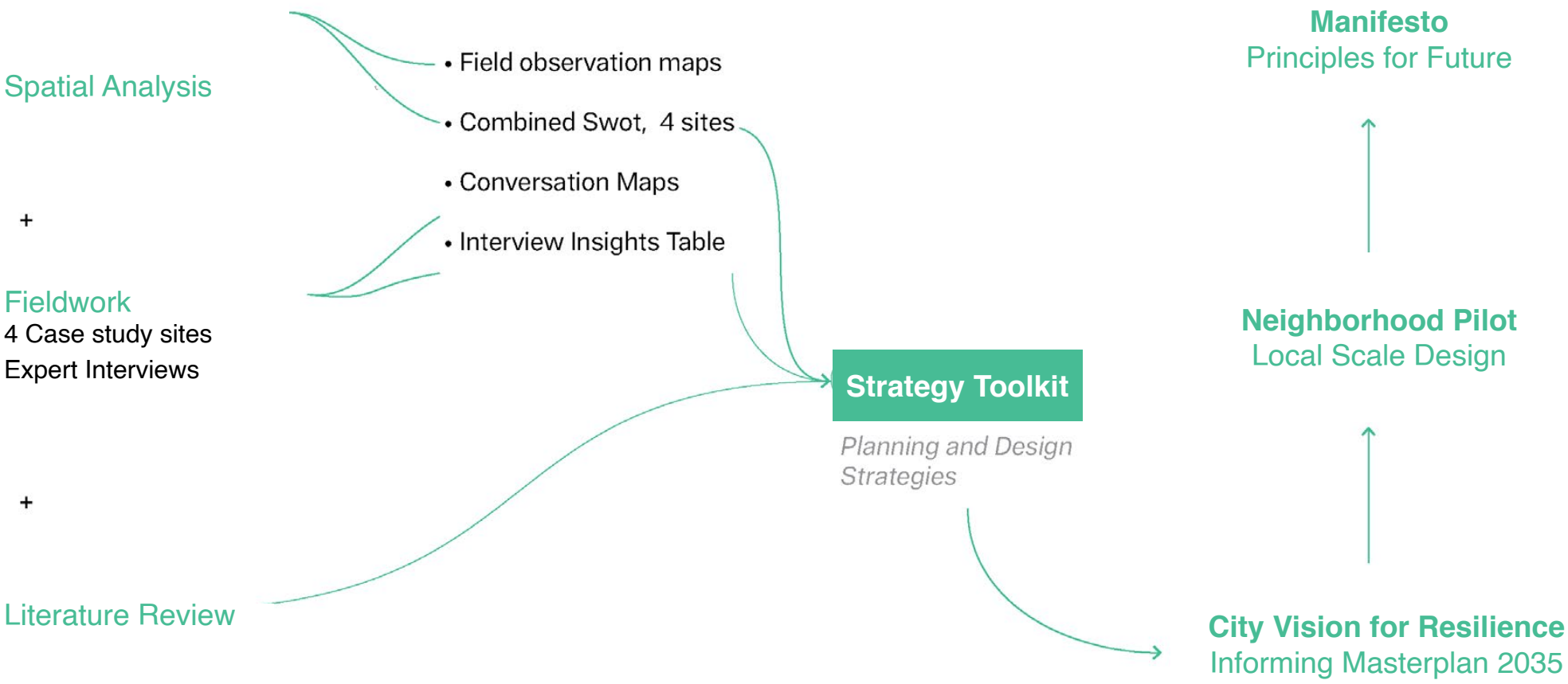
2. Who are the vernacular water traditions and networks, can resilience be interpreted in their nature-based solutions?

Planning Gap

3. How can adaptive spatial planning inform traditional living with water towards sustainability?

Methodology

Research lens



Analysis

2

Former Mar Canal, Converted to an arterial road,1970s

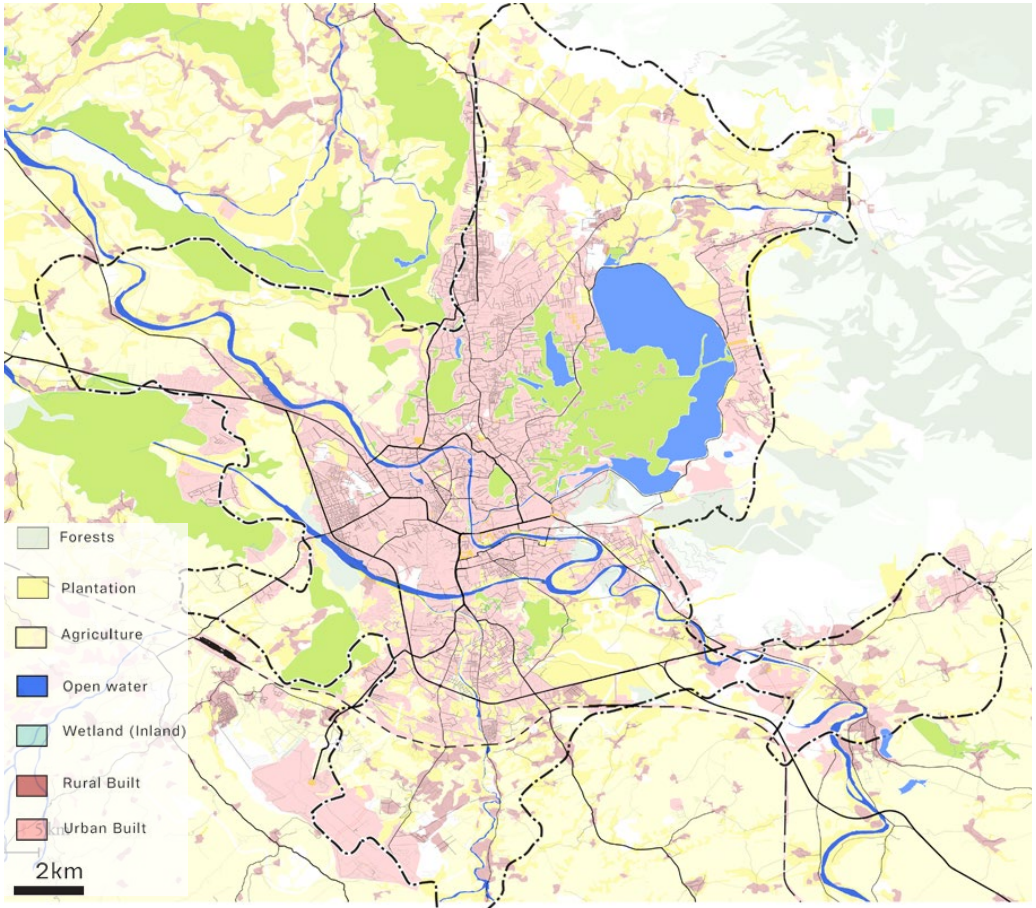
Source :Kashmir by Francis Younghusband, 1917

Tracing Evolution of the City

What it was?

1900 Map: Settlement at Jhelum, Floating garden interface at Dal

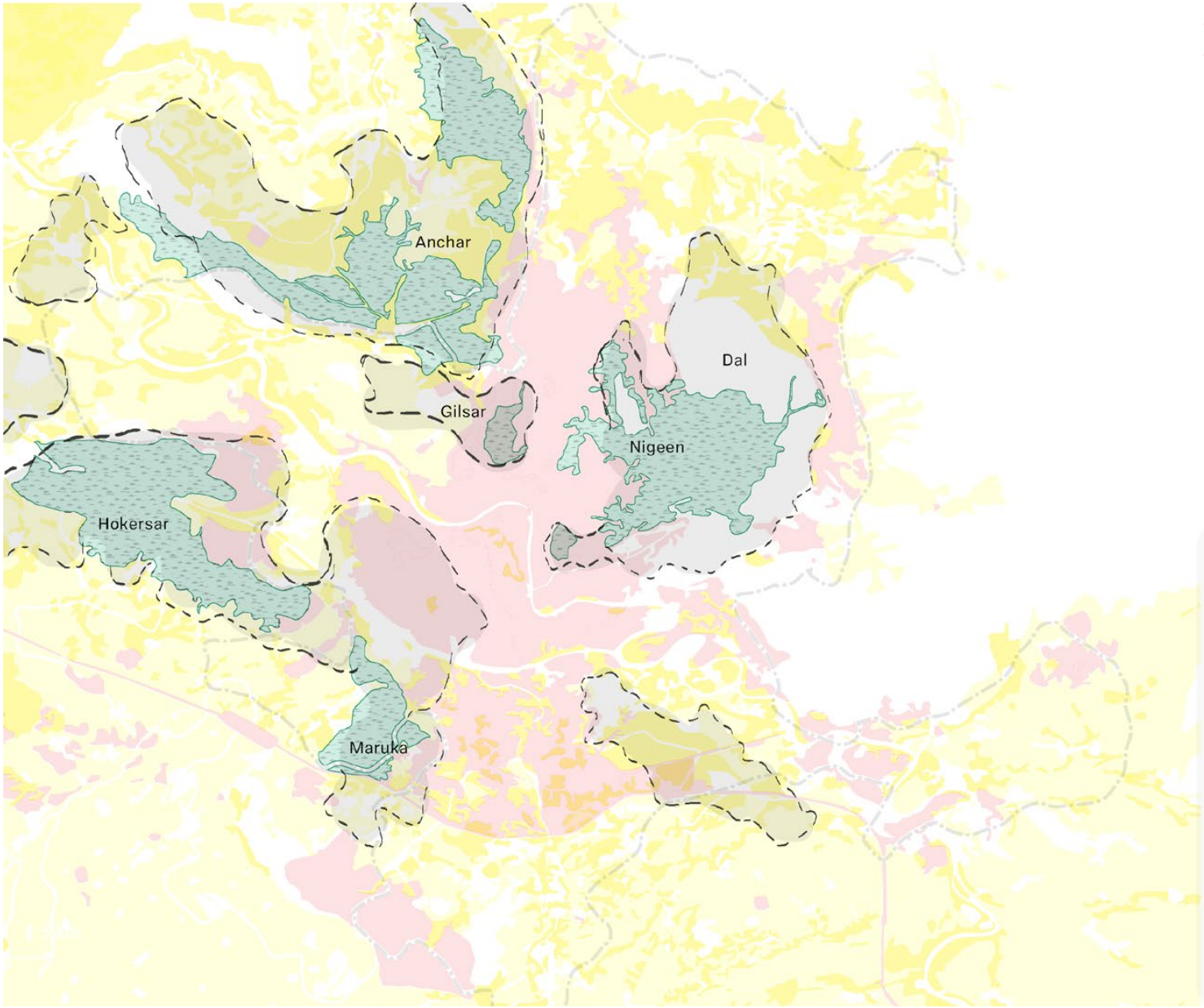
What it is?



2016 Map: Settlement along primary roads and city expanding towards peri-urban wetland

The City Sits on Marshes

Spatial Analysis

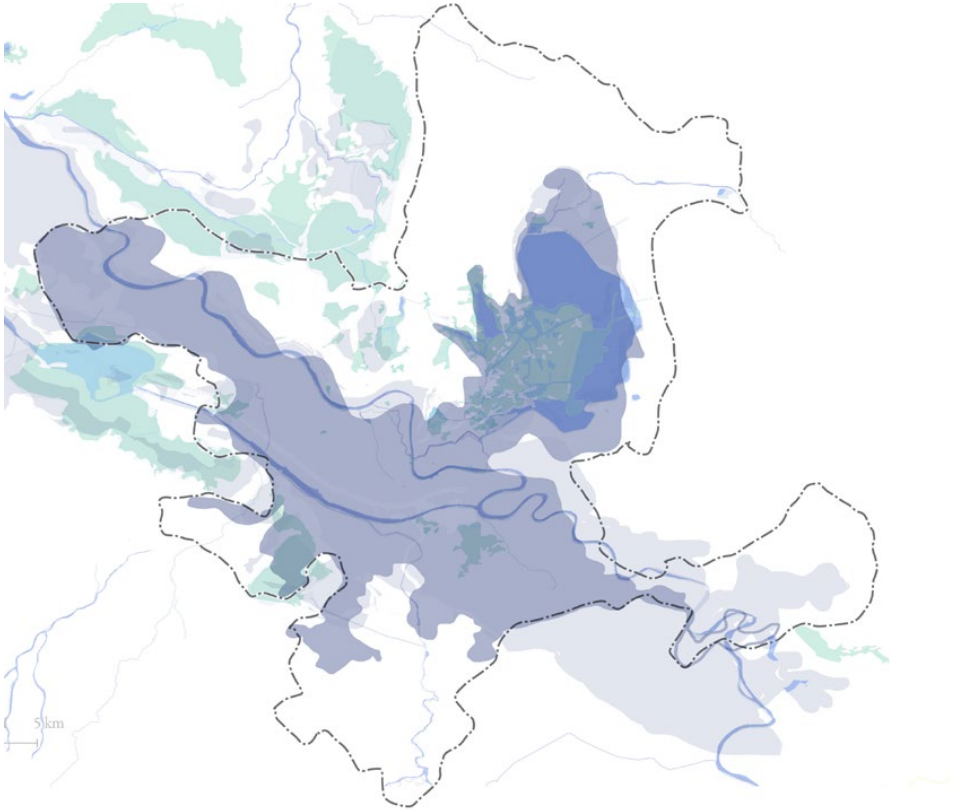


- Shrinking wetlands
- A Marshy city

Flood Risk and Vulnerability

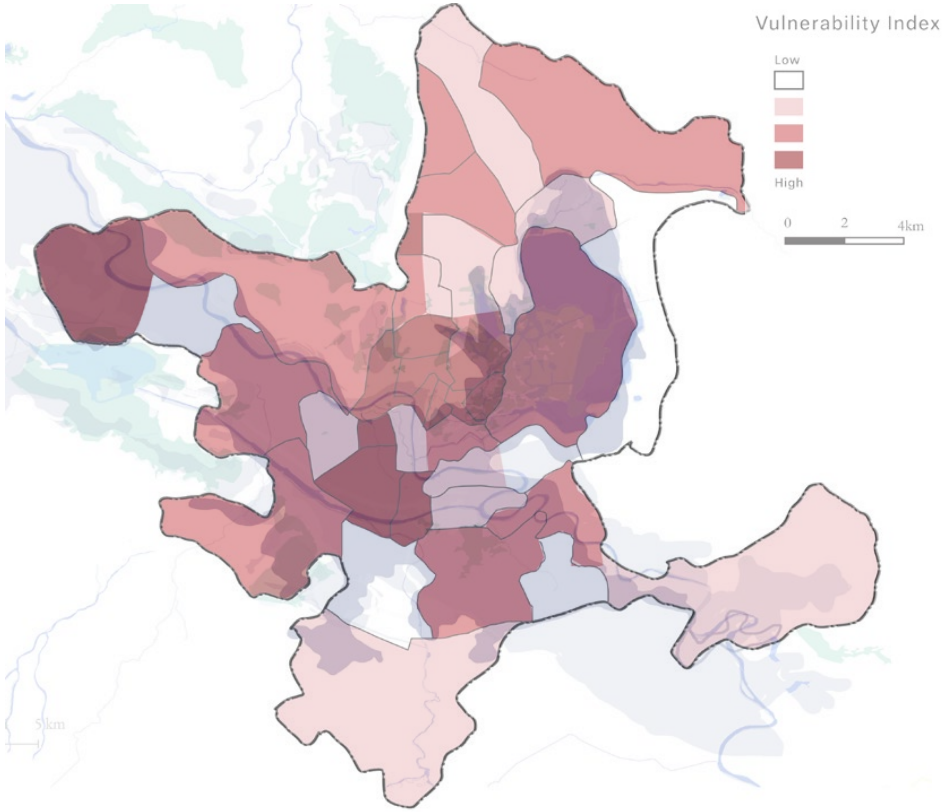
Spatial Analysis

South of Jhelum at risk



2014 Jhelum Flood Map

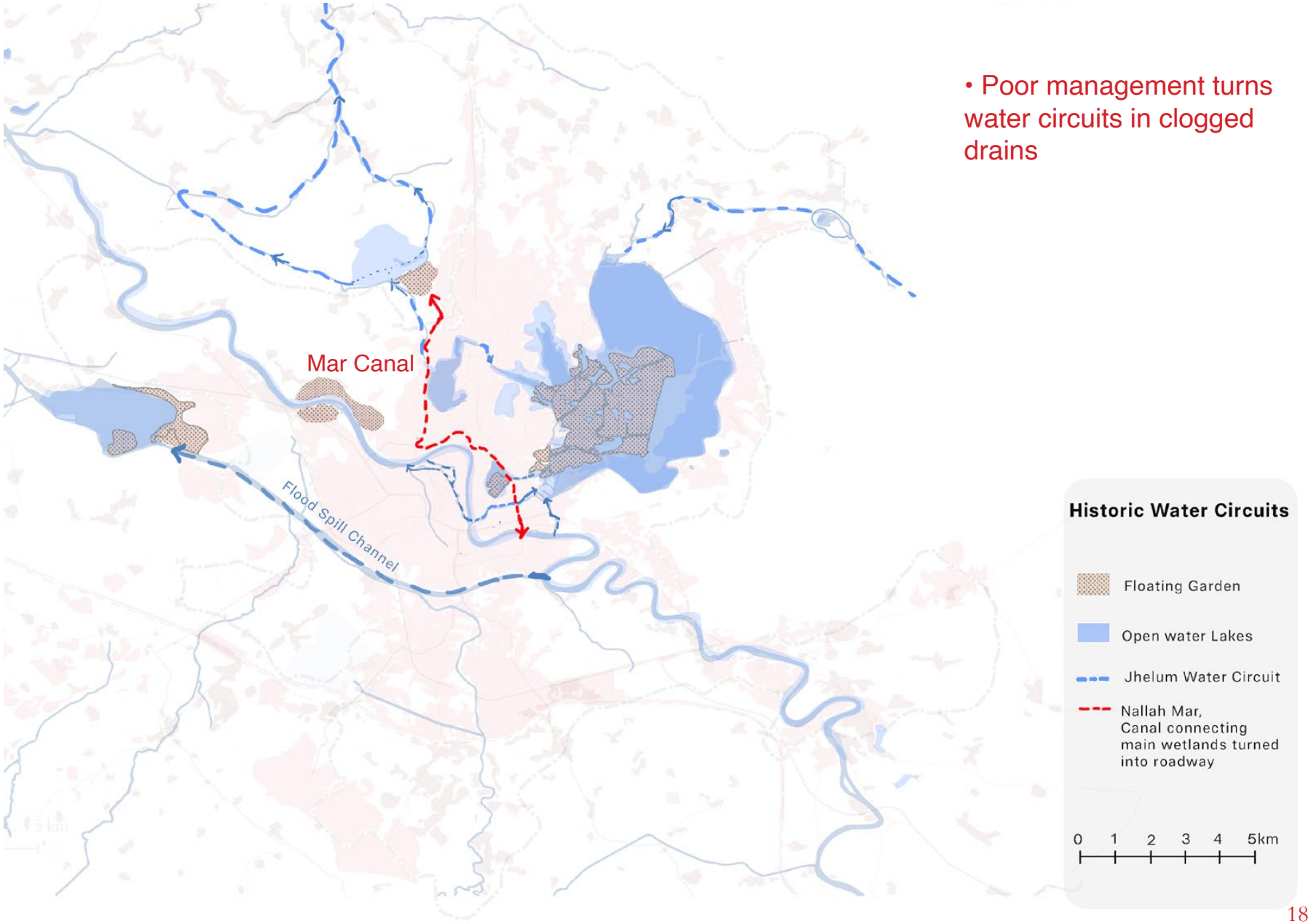
Vulnerability overlaps wetland communities



Flood Vulnerability Mapping

Jhelum Water Network

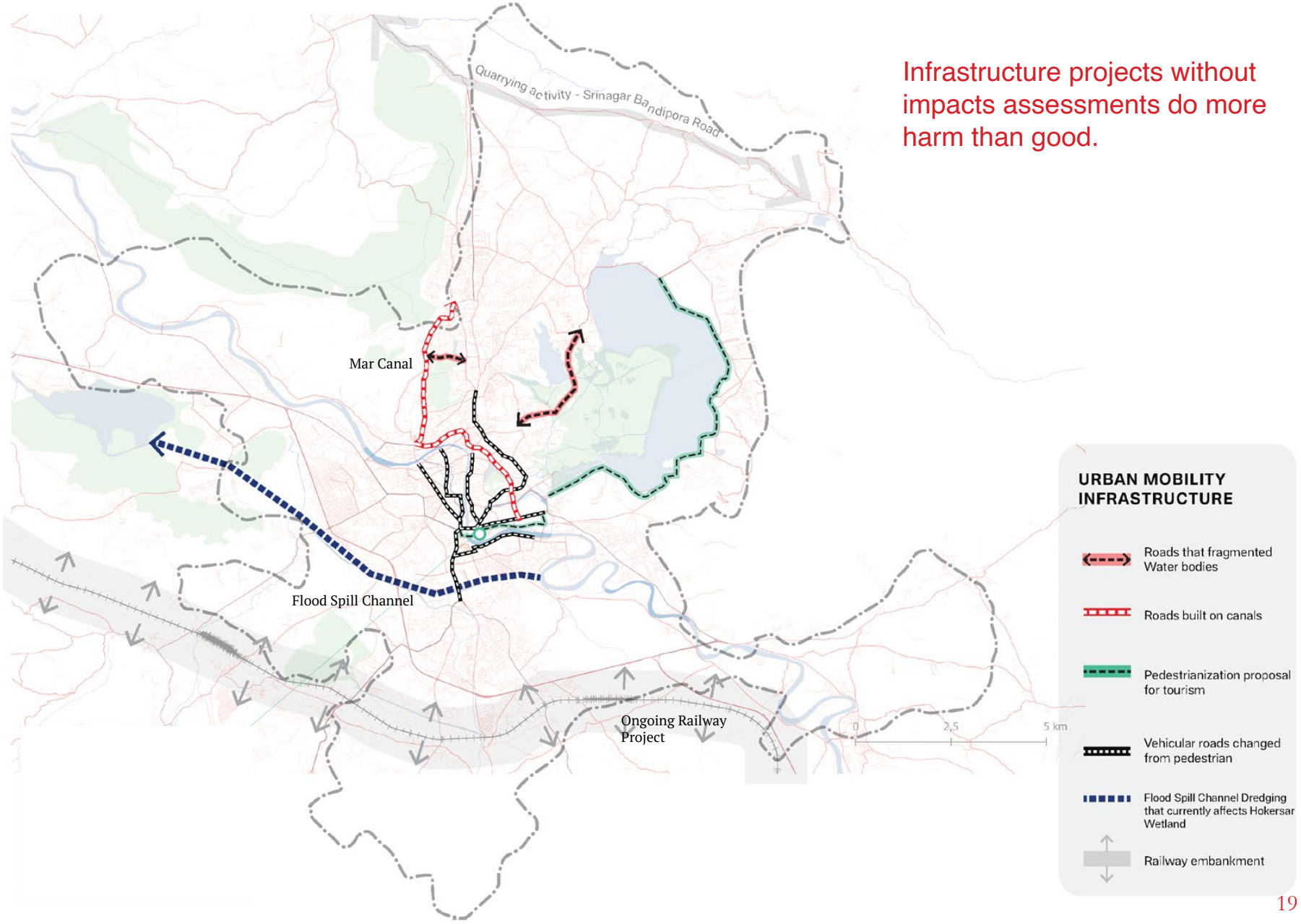
Spatial Analysis



- Poor management turns water circuits in clogged drains

Infrastructure Map

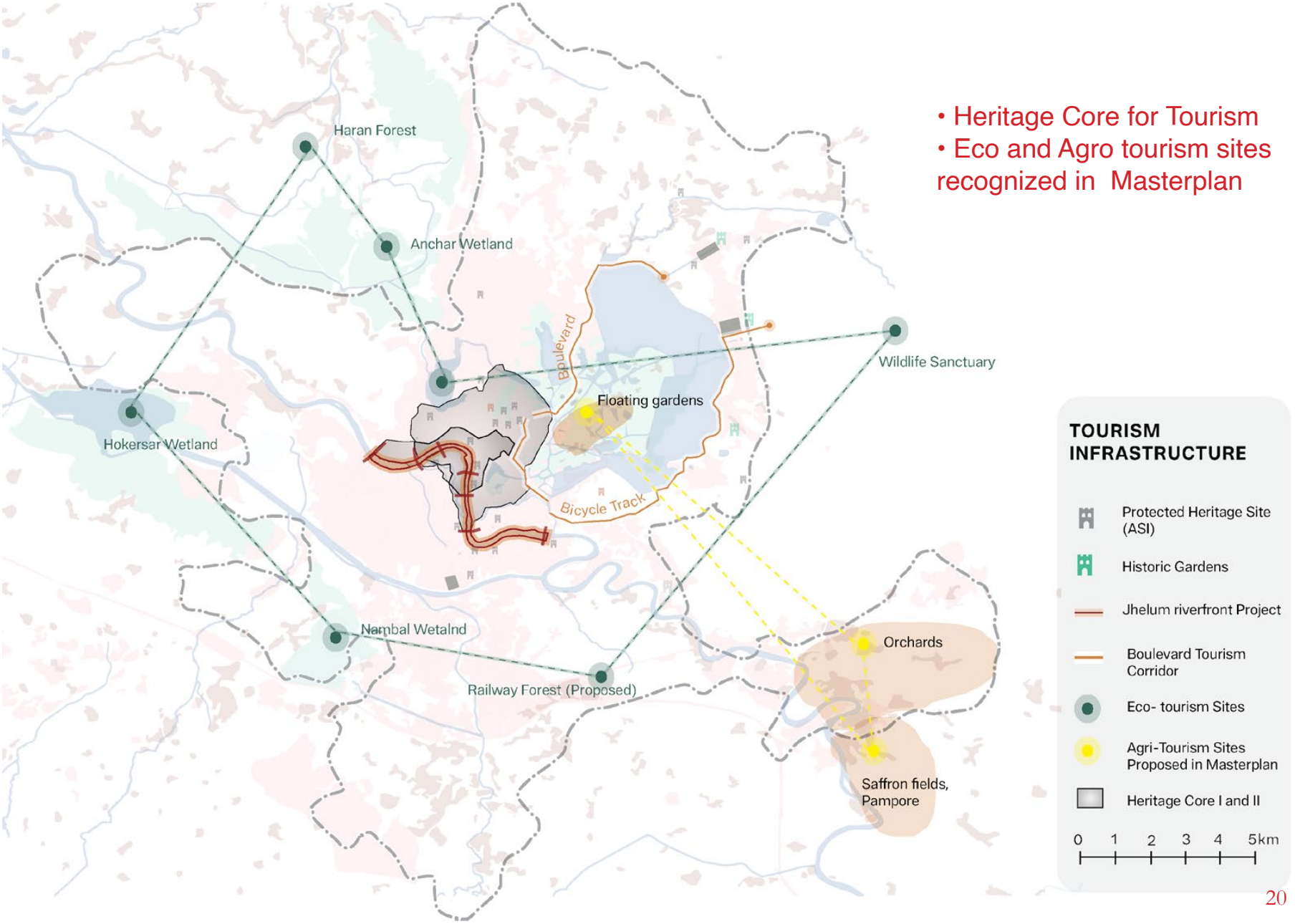
Spatial Analysis



Infrastructure projects without impacts assessments do more harm than good.

Tourism Infrastructure

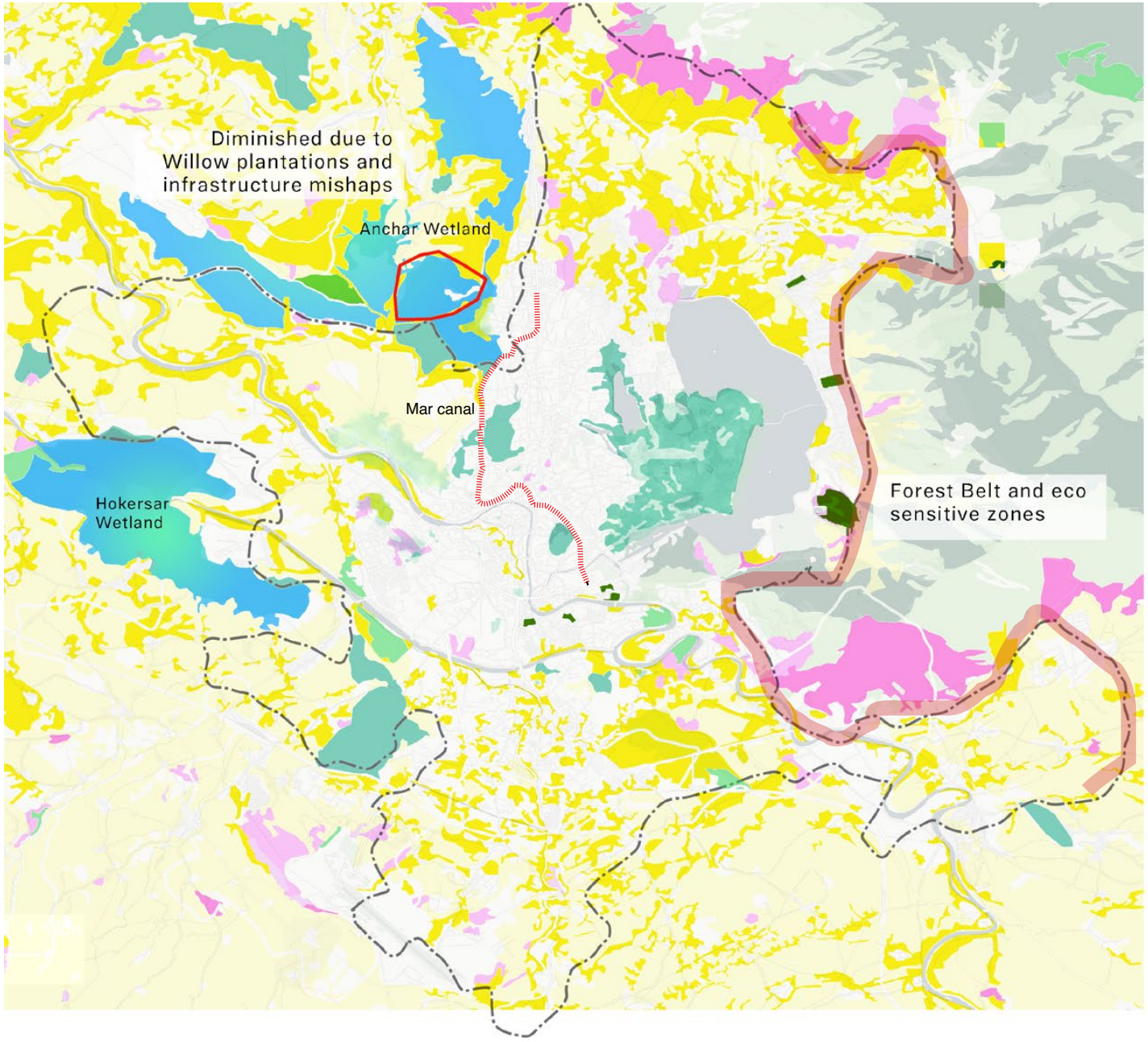
Spatial Analysis



- Heritage Core for Tourism
- Eco and Agro tourism sites recognized in Masterplan

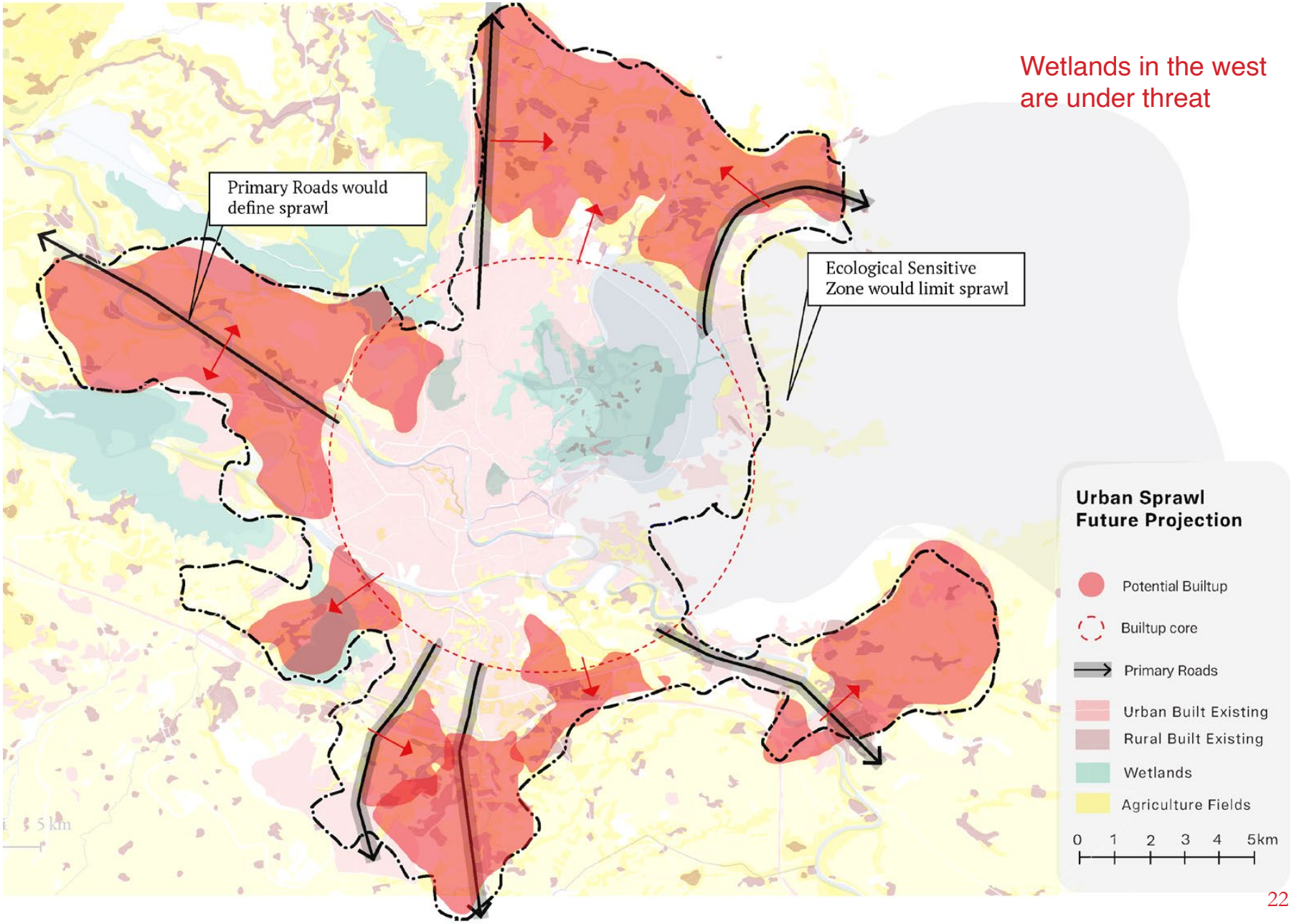
Ecology Map

Spatial Analysis



- City Growth Limits,
- Urbanization Strains on ecology in the west

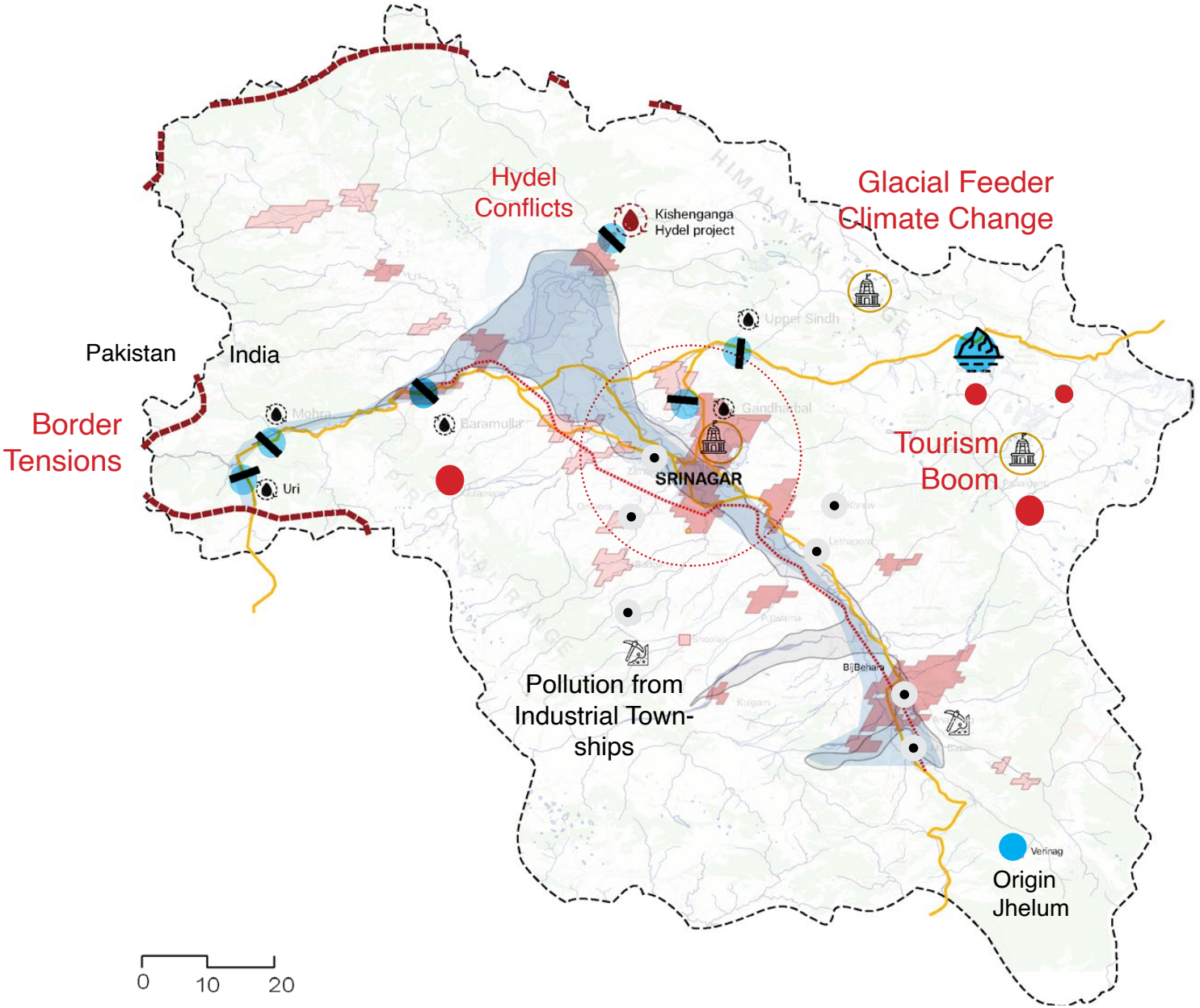
Projection Map I What it could be?



Wetlands in the west are under threat

Jhelum Basin

Urgenicies and Opportunities



LEGEND

Borders

- Border Disputed

Water Infra.

- River Jhelum and Tributaries
- Glacier Feeder
- Lake and Wetlands
- Flood Inundated Area
- Dam
- Hydro Electric Power Project Ongoing
- Hydro Electric Power Project Completed

Urbanization

- Settlements
- Tourism townships
- Industrial townships
- Pilgrimage Site
- Mining Site

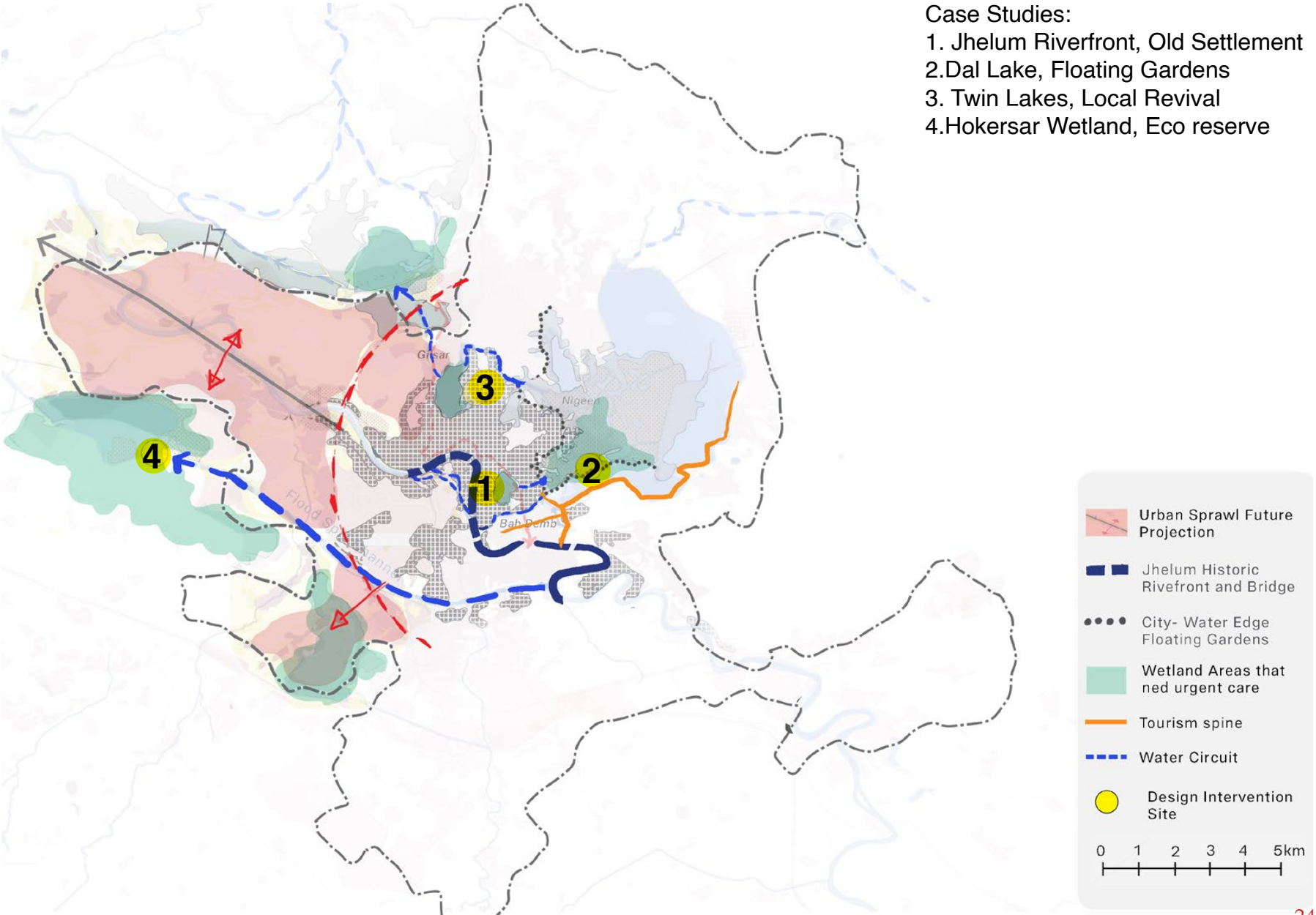
Transport Infra.

- Road Highway
- Railway Line
- Pilgrimage Route

Spatial Synthesis

Selection of Case Study Sites

Case Studies:
1. Jhelum Riverfront, Old Settlement
2.Dal Lake, Floating Gardens
3. Twin Lakes, Local Revival
4.Hokersar Wetland, Eco reserve



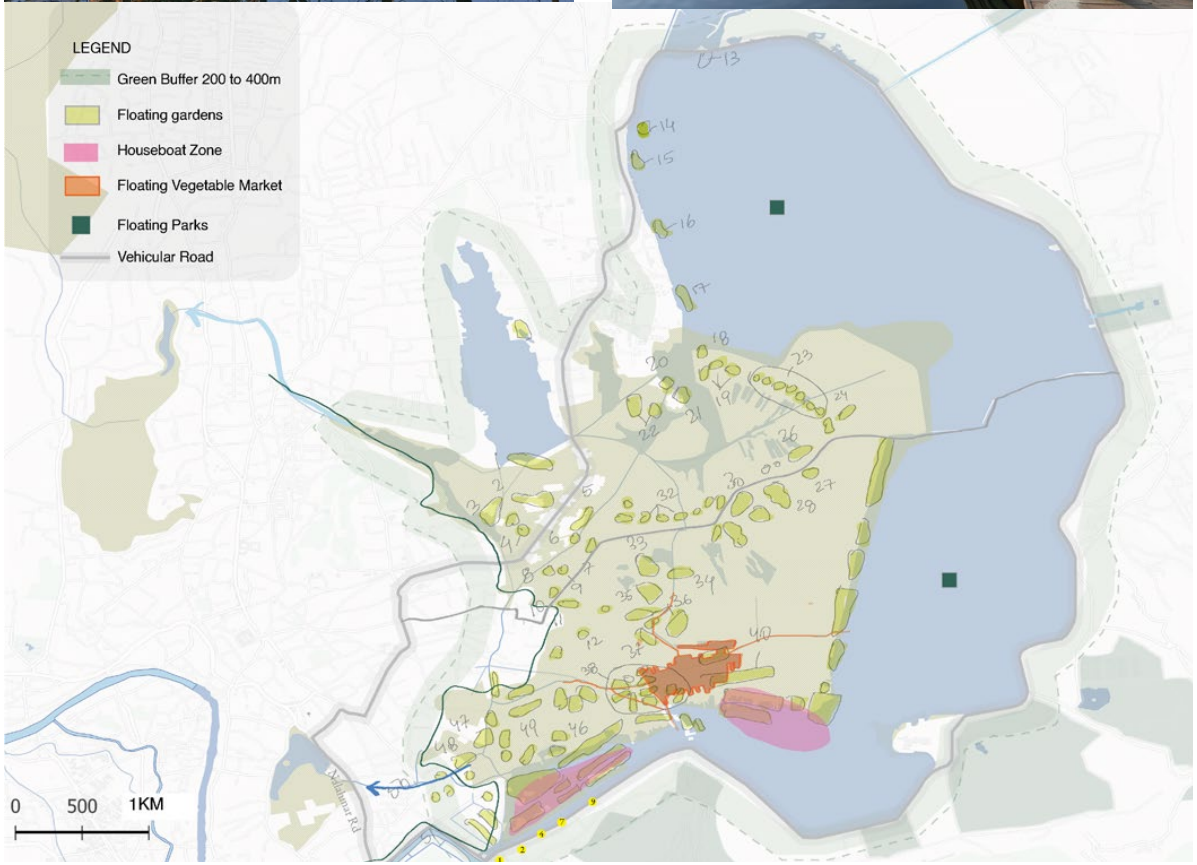
Site 1: Jhelum Riverfront

The strength is Heritage, Mixed Use Neighborhood

However Conflict created abandonment, traffic congestion with infrastructure shifts

Opportunity:
Social Cohesion and recover abandoned heritage relationships with water Navigation

Site 2: Dal Lake Floating Islands

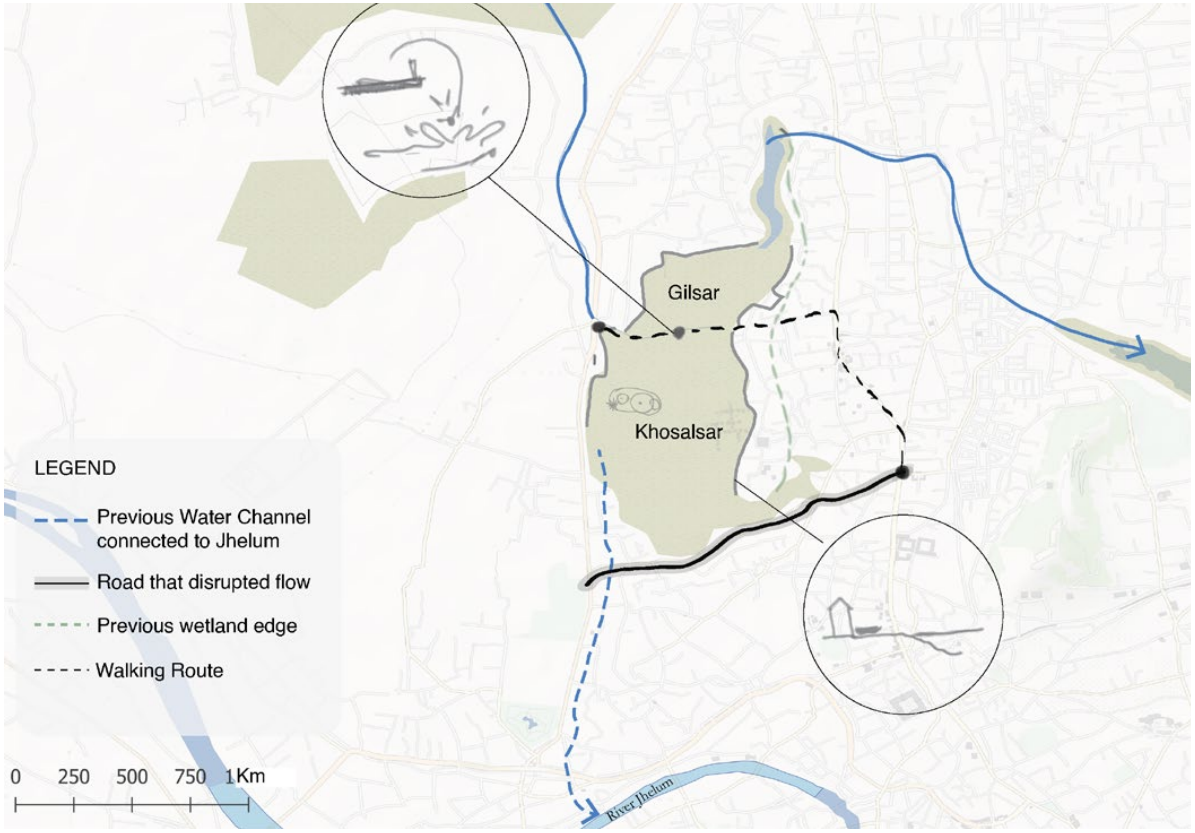


The strength is a robust social structure of ancestral occupations of Haenji.

However unsustainable tourism boom, conflict led distrust and planning gap

Opportunity:
Symbiosis: tourism and ecology and Democratic Conservation process

Site 3: Twin Lakes

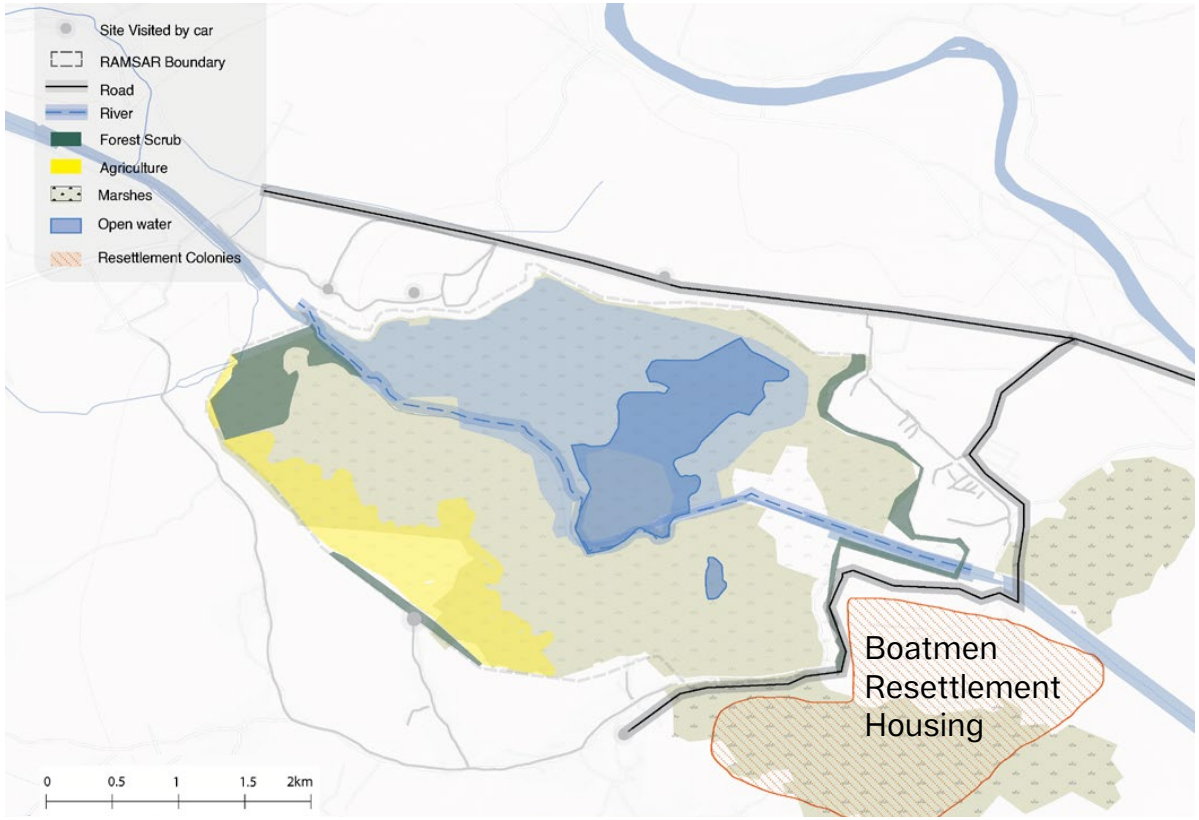


The strength is a the first example of collaborative planning approach.

However still an abandoned lake, Water Circuits are in poor state

Opportunity:
City Scale Solutions at water navigation, meet with local scale interventions Interaction zone.

Site 4 Hokersar Wetland



The strength is the site includes
a protected bird reserve for eco tourism.

However it is an important flood detention basin to be made a Resettlement Housing for Haenjis.

Opportunity:
Balance ecology and
Adaptable living at this marshy site.

Interview with Experts

- **Water Urban Conflicts**
- **Planning challenges**: Next big goals for sustainability and resilience
- **Vernacular water culture**
- **Design**, Water-based transport, ideal resilient neighborhood

Director,
Tourism Department

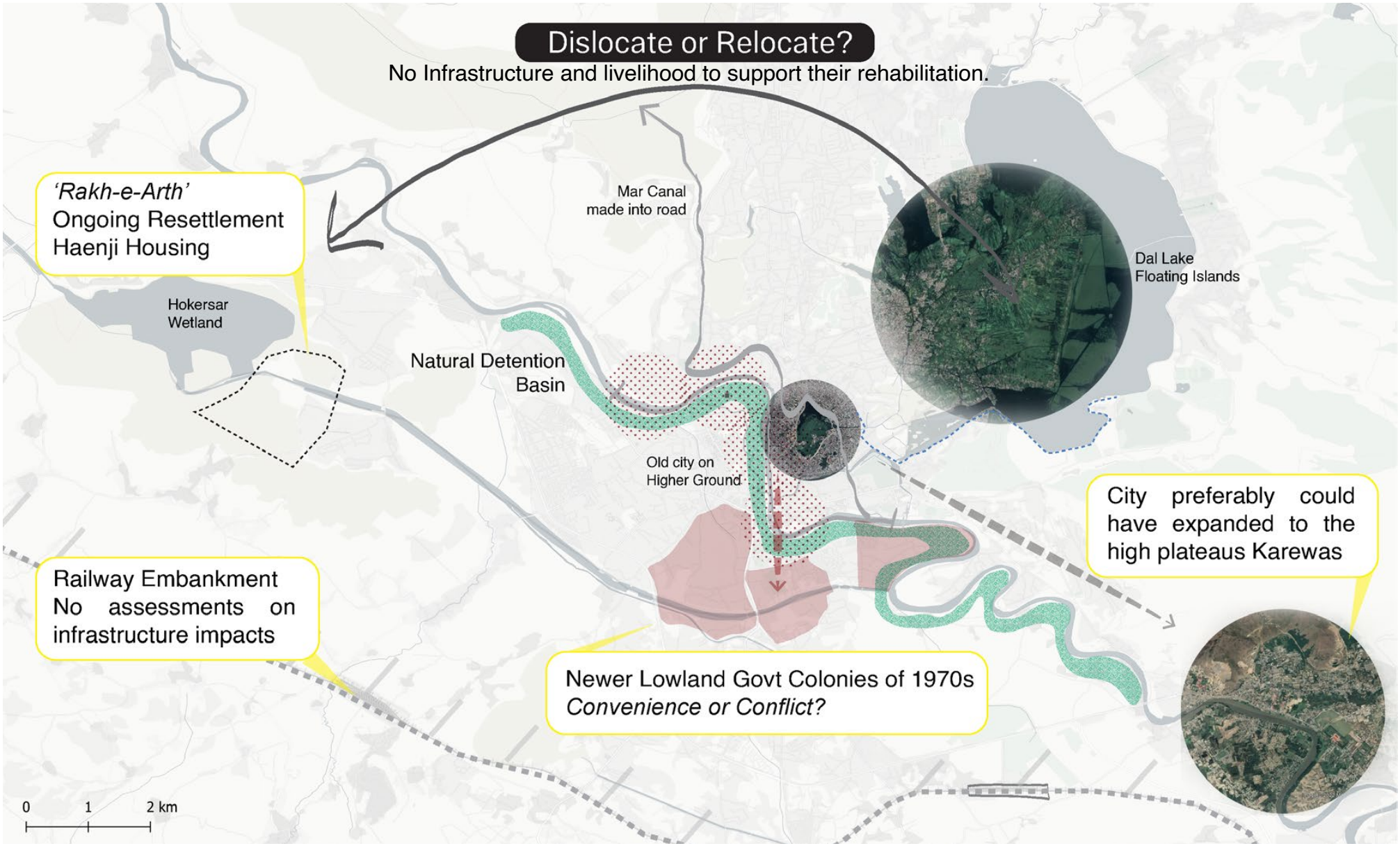
Town Planner,
Srinagar Development Authority

Consultant,
Irrigation and Flood Control Department

Secretary,
Lake Conservation and Management Authority

Wildlife Warden, Hokersar

Conversation Map



Conclusion of Analysis

Principles for Socio-Ecological Resilience

1. Diversity: biological, economic, and cultural

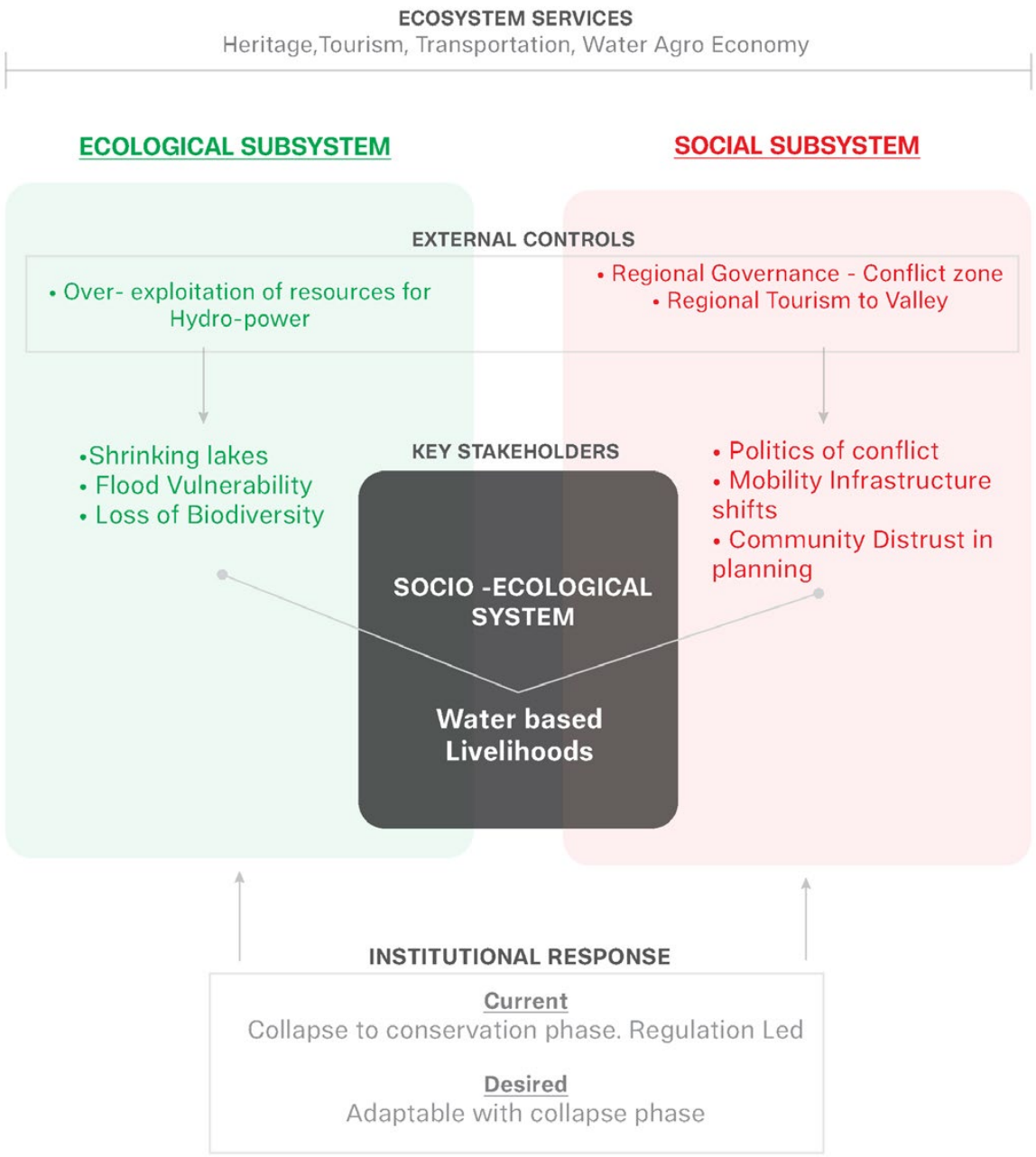
2. Creative renewal as an alternative to Preservation

3. Social learning through experimentation

4. Adapt governance to change.

Socio-ecological System

Jhelum, Srinagar



3. Design

Jhelum Riverfront with Abandoned Buildings

Jhelum Riverfront, Design Pilot

3

Strategy Toolkit

Design and Planning

PRINCIPLES

Design

- **Resourceful**
  Inventory of social memory reserves
- **Adaptation**
  General policies, specific case
- **Diversity**
  Function . Economy . Biology
- **Modularity**
  Balanced systems
- **Openness**
  Permeability

Process

- **Creative renewal**
  Alternate to preservation
- **Policy feedback loops**
- **Experimental learning**
  Breaking policies fixation
- **Create stewardship**
  Roles and responsibility to informal institutions.

TOOLS

Social

Reclaim Vernacular Claims
With water based heritage and livelihoods

Adaptable
Making Room for change with time

Modular Systems
Interconnect subsystems loosely connected to other parts

Ecological

Permeable River
Softening River edges with green infrastructure and open spaces

Re-purpose Water
Diversify degraded ecosystems with a new function

Process

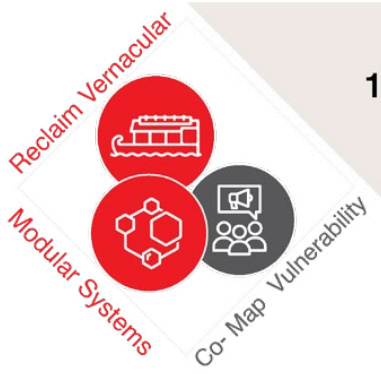
Co Map Vulnerability
Form a Neighborhood Water Board with community advocates

Policy-experiment-pilot
Experiment feedback loop

Conflict Resolution Board
Middle Ground of Academicians, Scientific community and international organizations

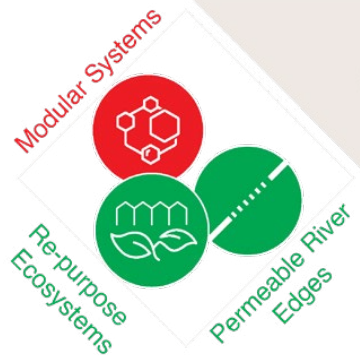
3 Strategy Themes

Design



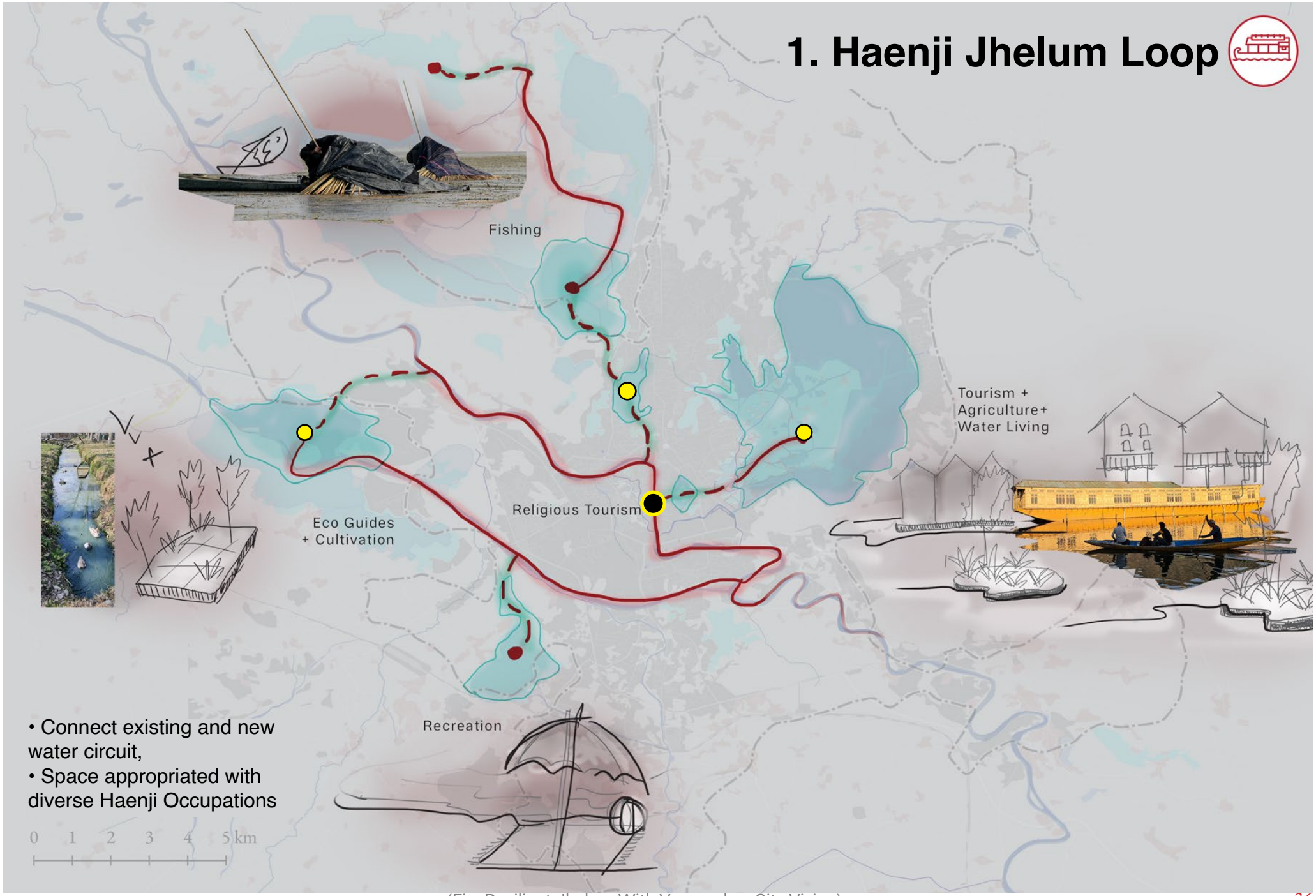
1. Haenji Jhelum Loop

2. Research and Recreation Corridor



3. Permeable Left Bank

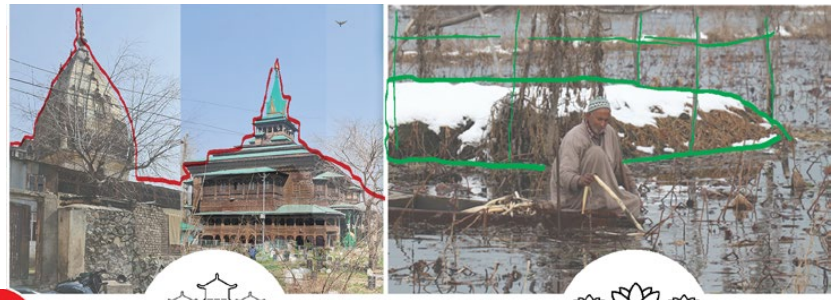
1. Haenji Jhelum Loop



(Fig Resilient Jhelum With Vernacular -City Vision)

Local Governance Unit

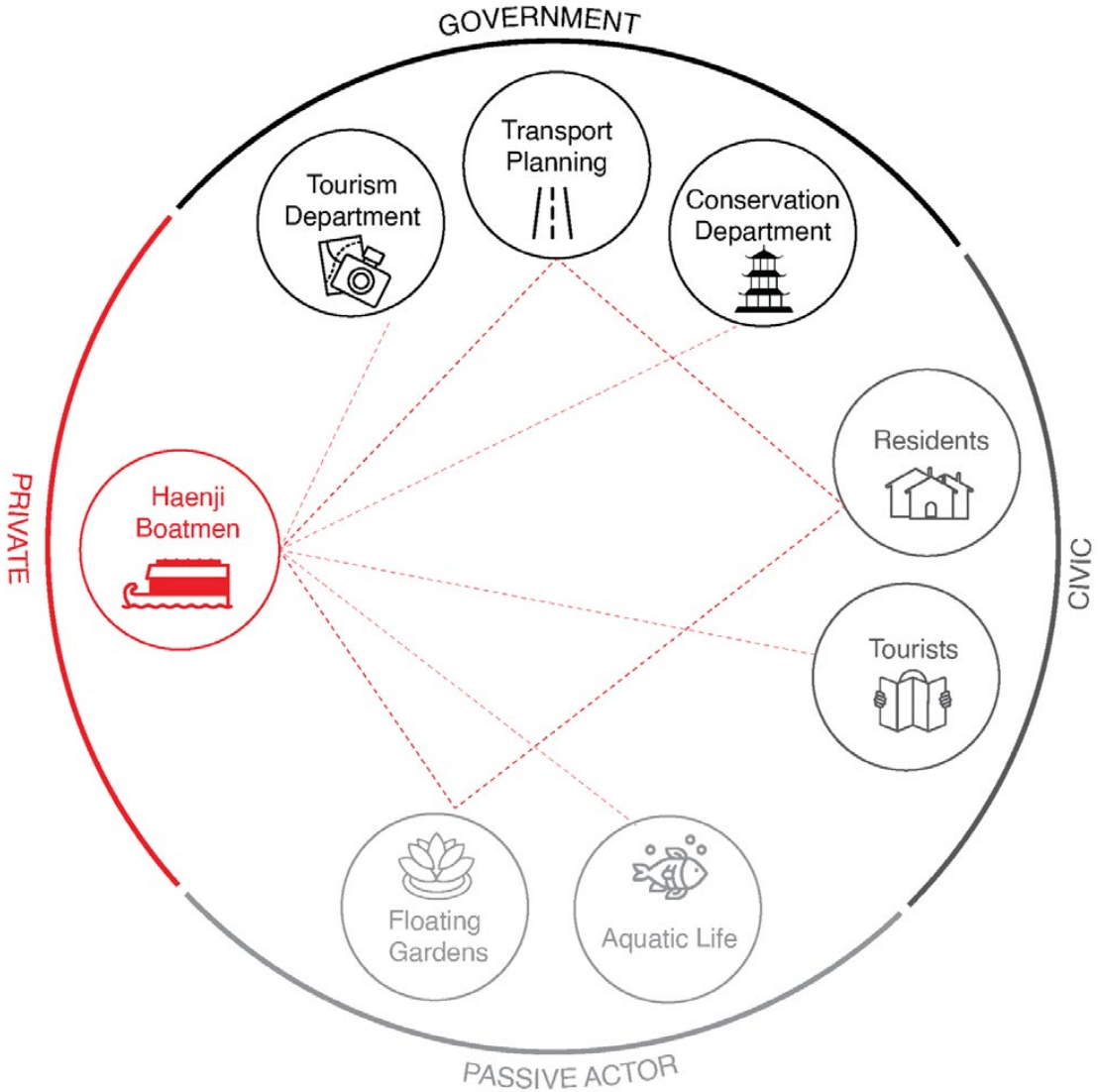
Planning



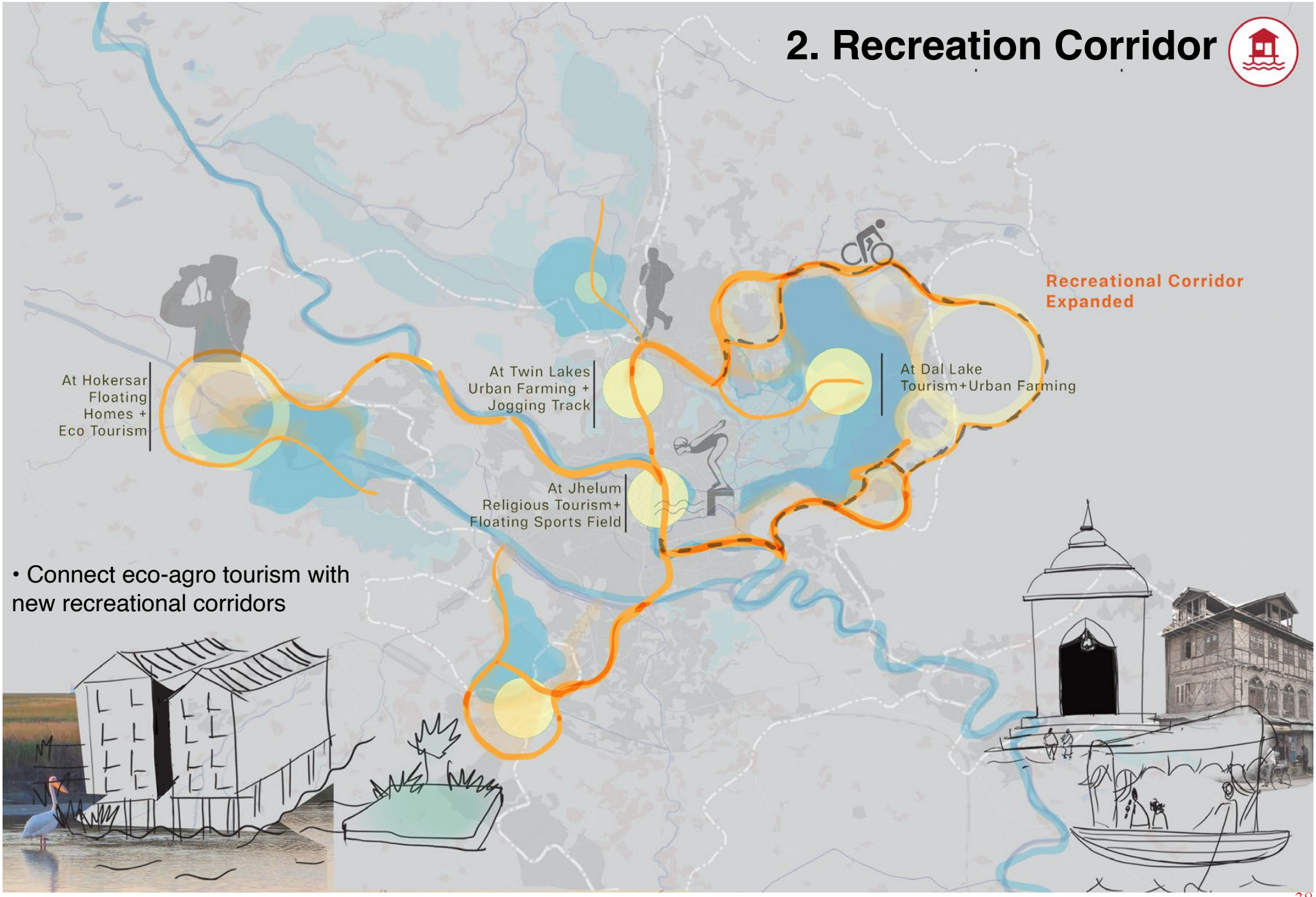
Riverfront Shrines, Monuments

Vernacular Water Agriculture

Haenji - Boatmen, connector

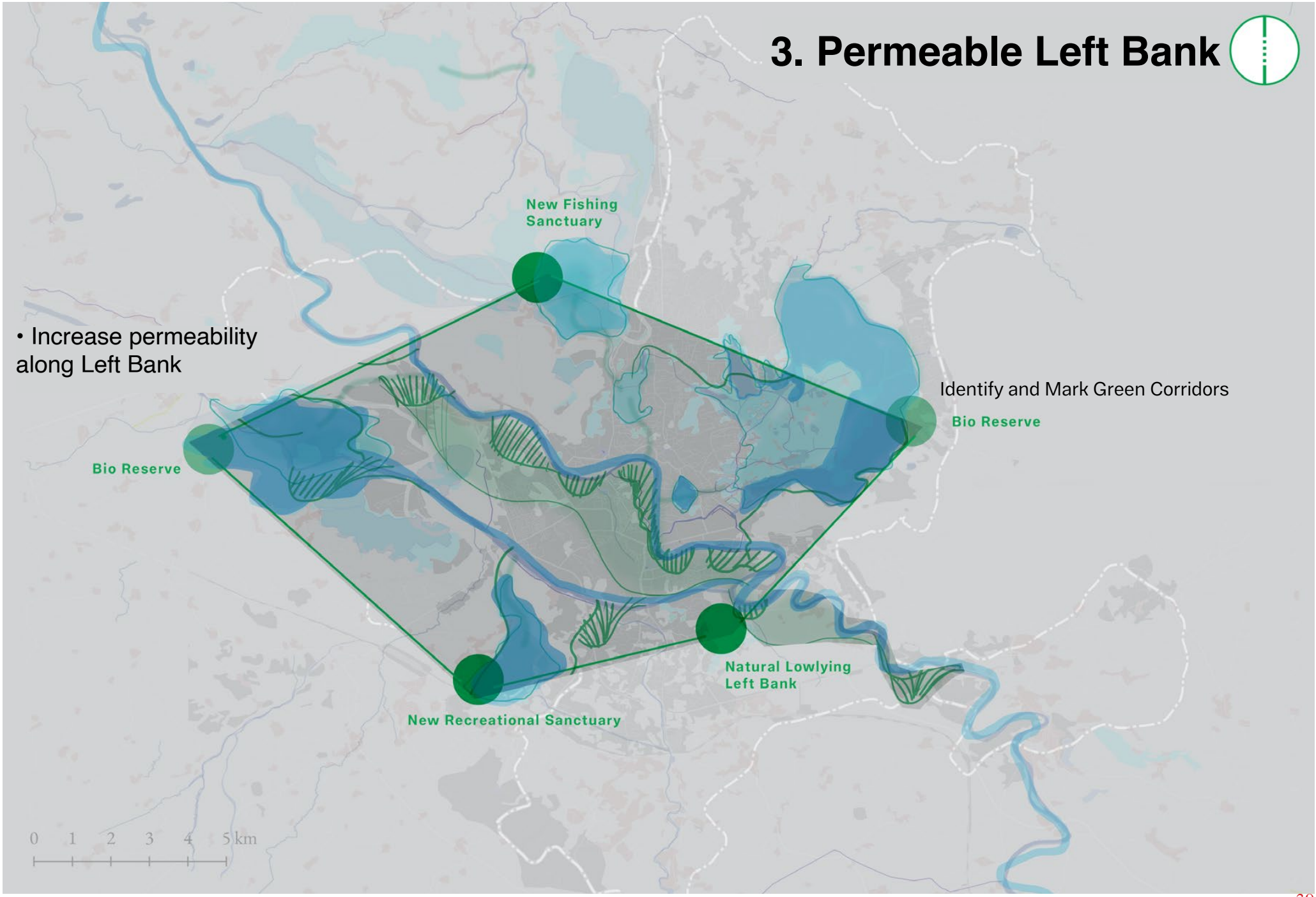


2. Recreation Corridor



• Connect eco-agro tourism with new recreational corridors

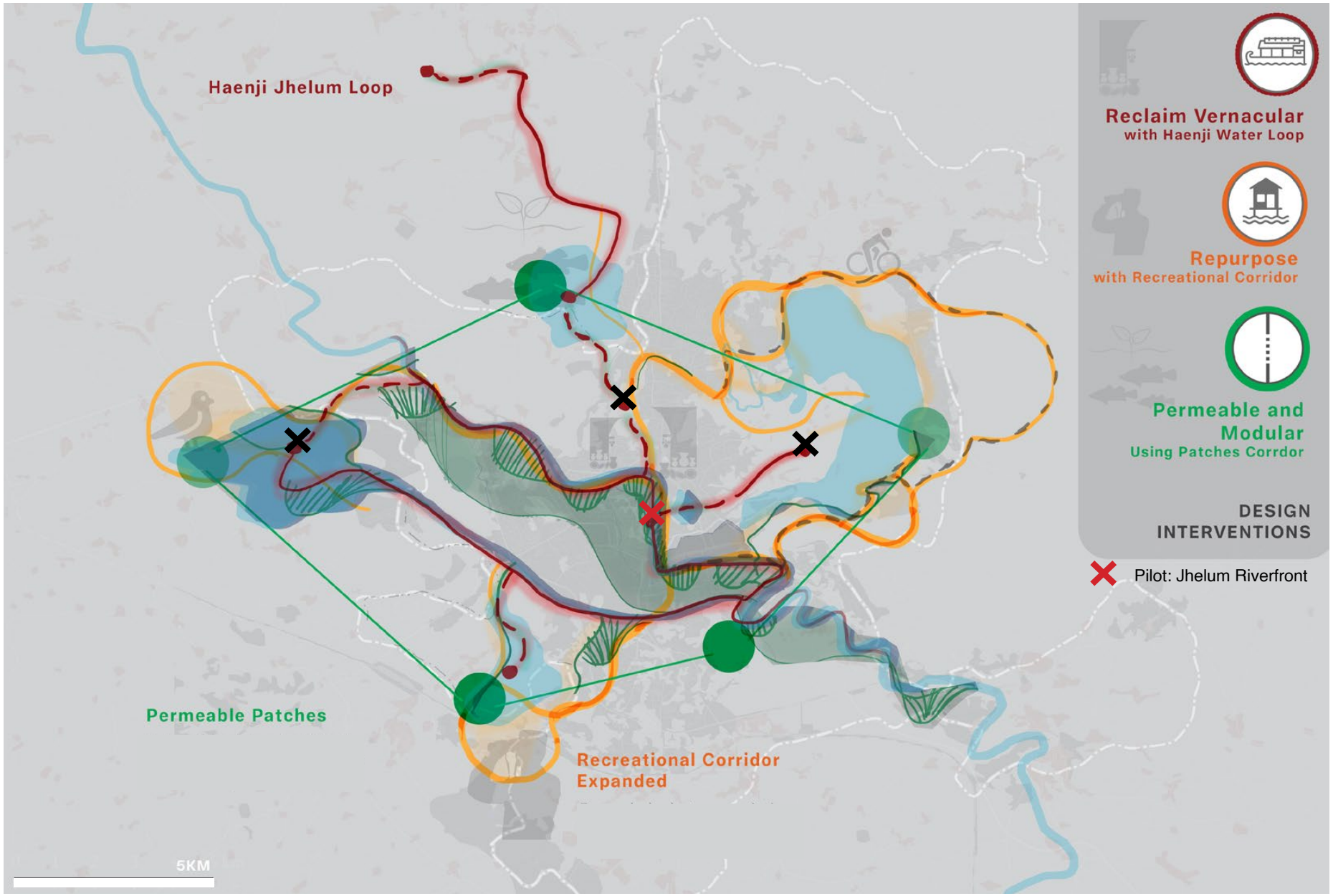
3. Permeable Left Bank



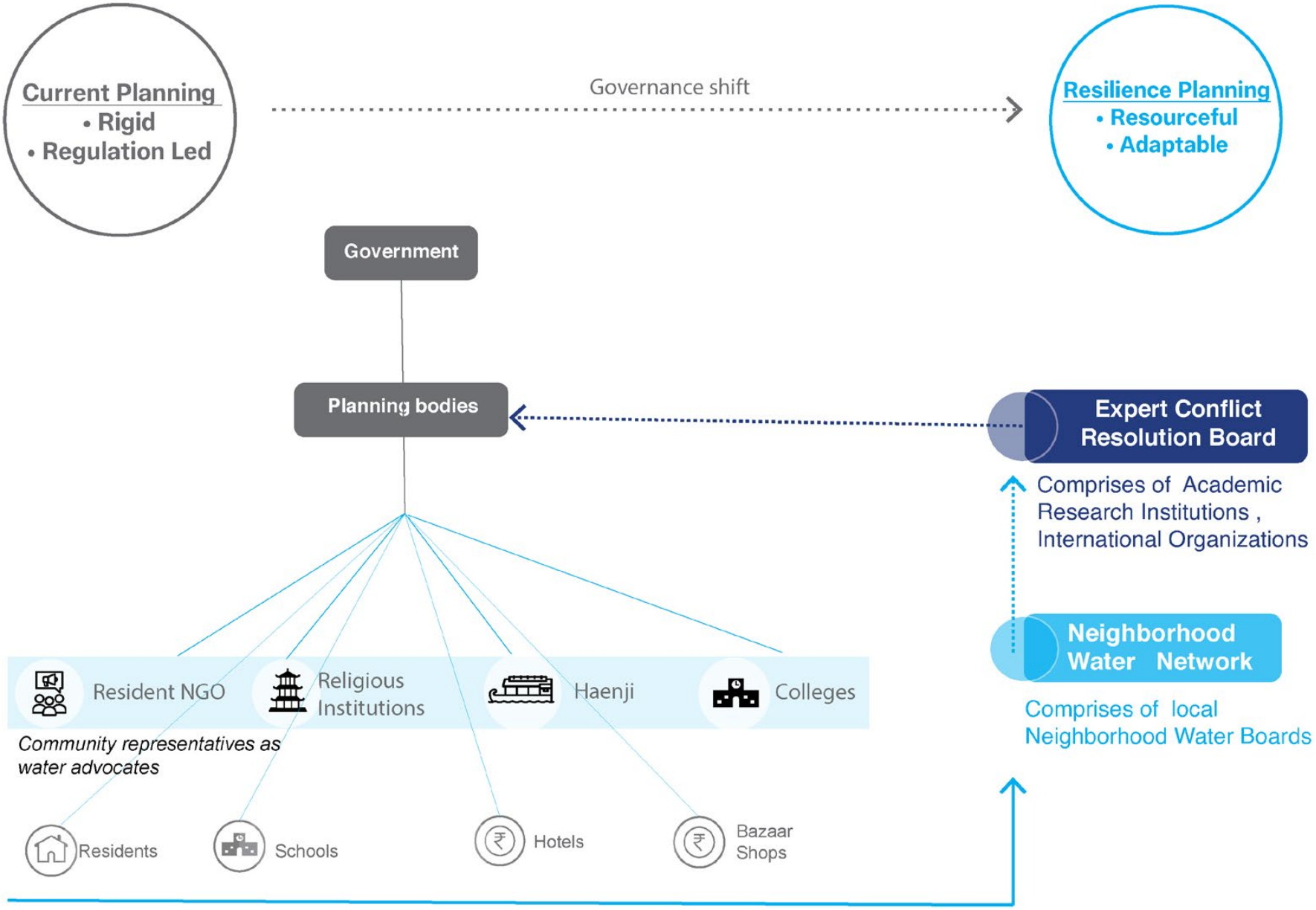
- Increase permeability along Left Bank

Identify and Mark Green Corridors

City Vision

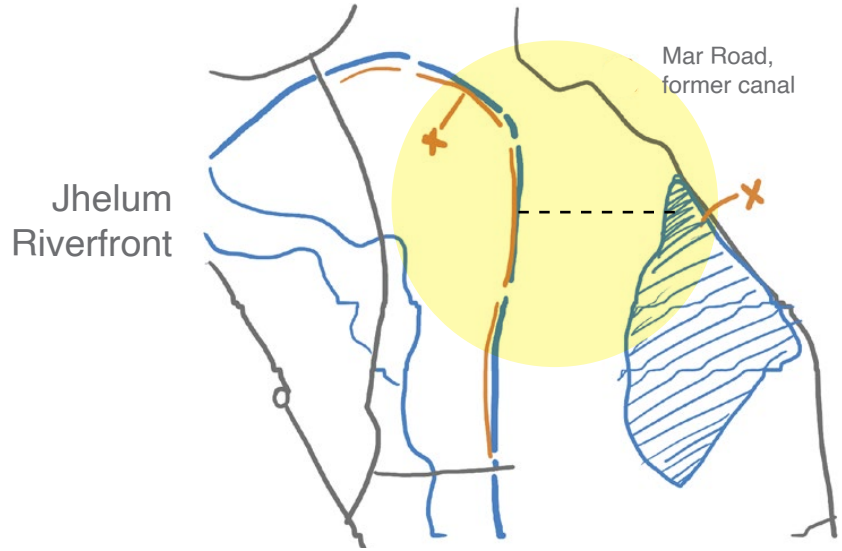

Haenji Jhelum Loop
Reclaim Vernacular
with Haenji Water Loop
Repurpose
with Recreational Corridor
Permeable and
Modular
Using Patches Corrdor
DESIGN
INTERVENTIONS
Pilot: Jhelum Riverfront
Permeable Patches
Recreational Corridor
Expanded
5KM

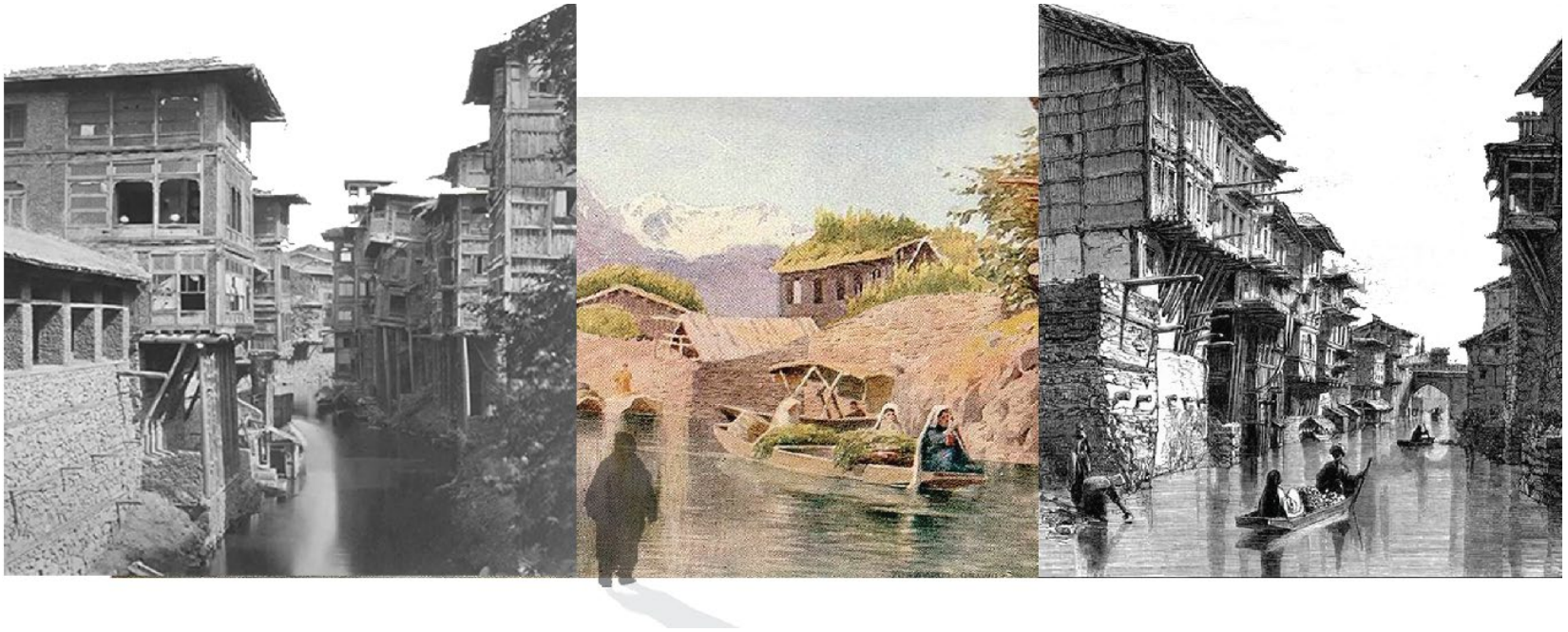
Governance Vision



Neighborhood Pilot

Jhelum Riverfront





Mar Canal that was later made into a primary road, Collage

What it was

Jhelum Riverfront

Cluster- Courtyards of Old River Jhelum Riverfront

Nallah Mar *(That was)*

Roads

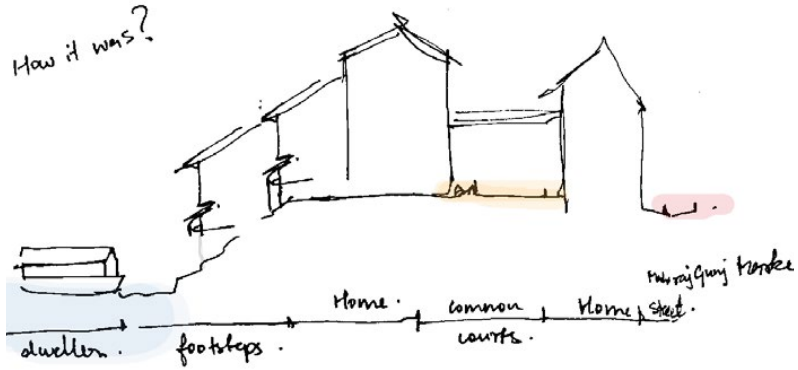
Bazaar St.

Embankment Roads discontinuous

Courtyards Clusters

Shrines Court

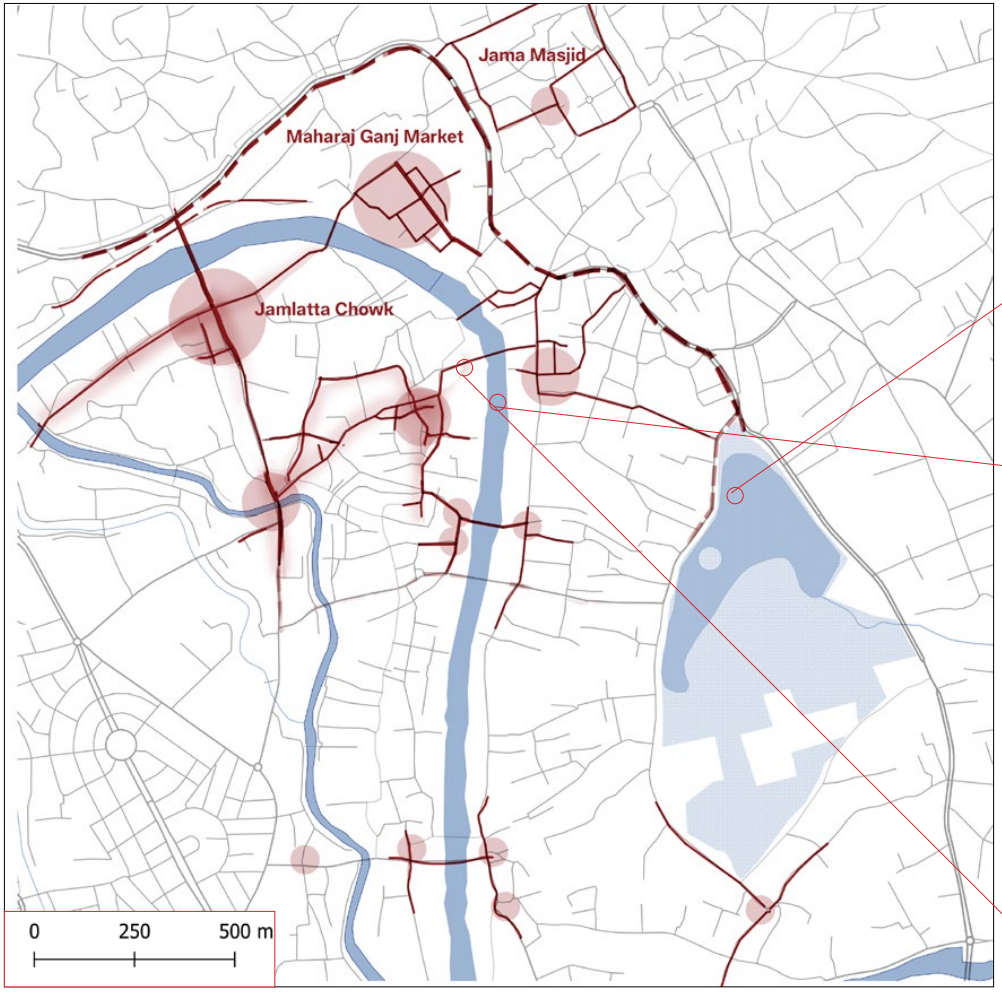
Shrines



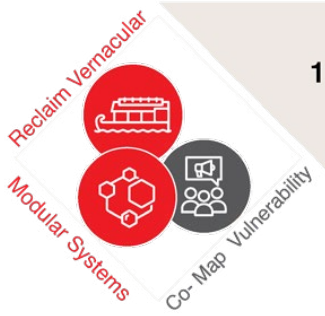
Section of Cluster Courtyards to riverfront steps

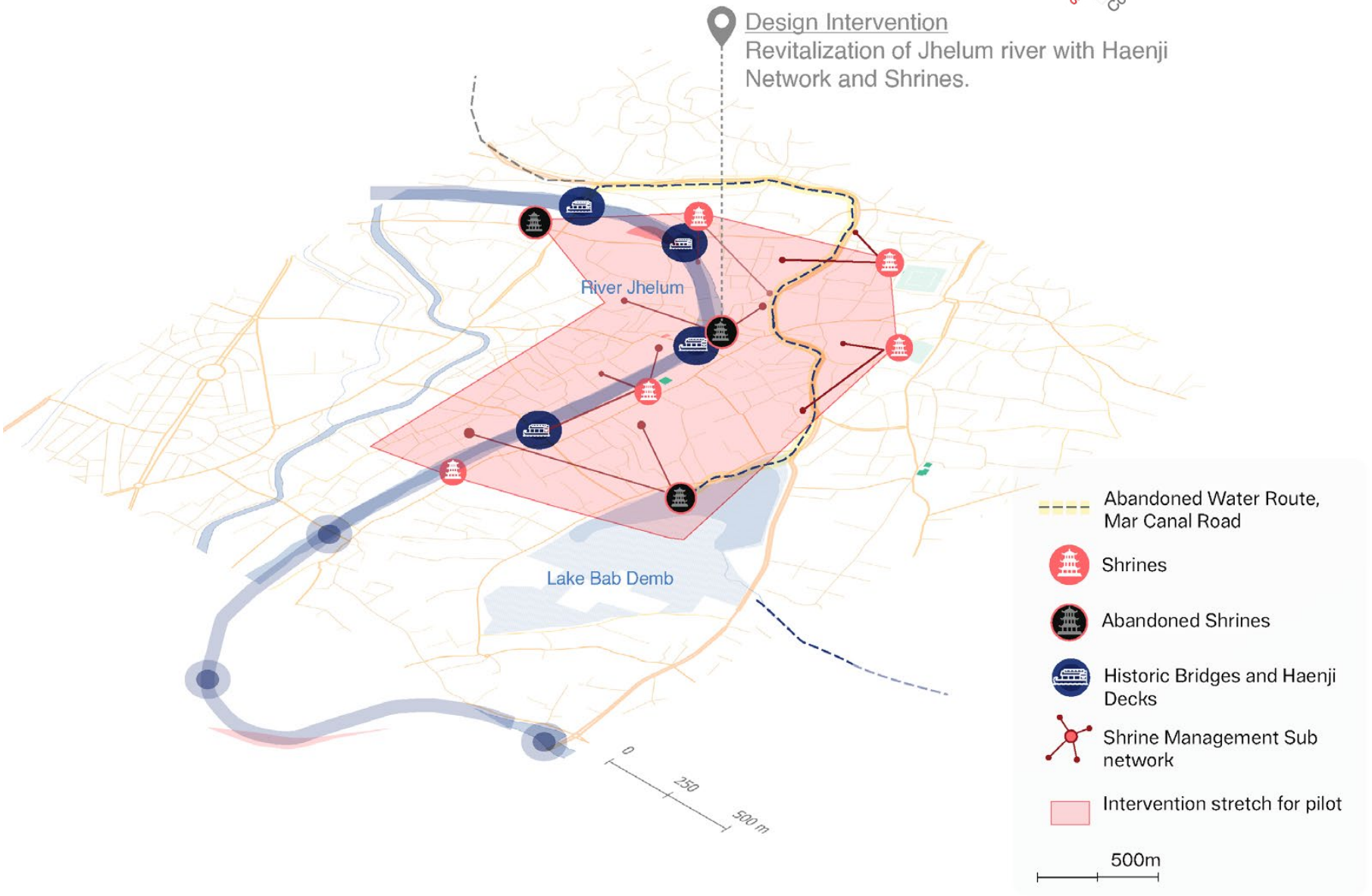
What it is

Jhelum Riverfront



Pilot Theme 1



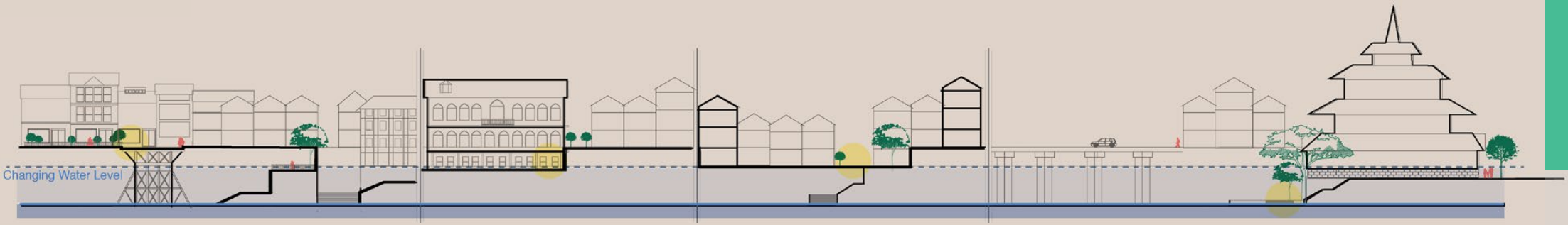


Before

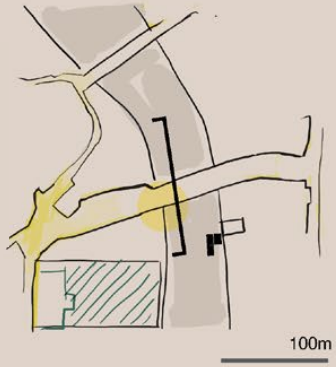
Bridge Junction

Abandoned Heritage

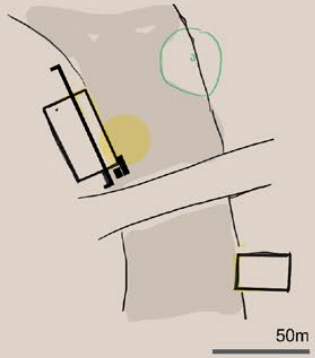
Riverfront Steps to Courts



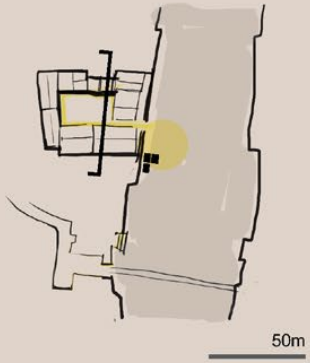
The bridge



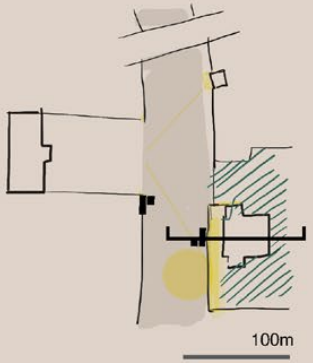
Abandoned heritage

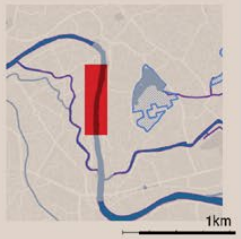


Residential Cluster Courts

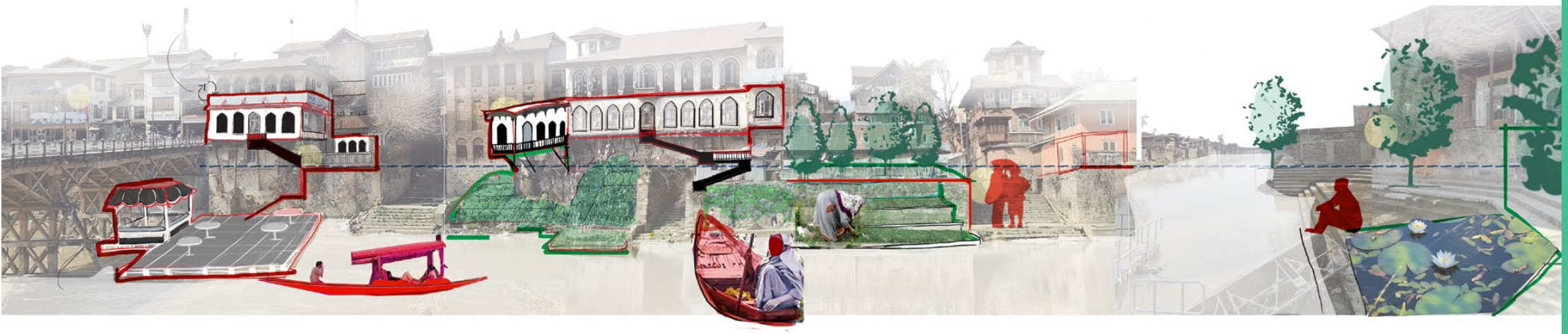


Shrine Steps

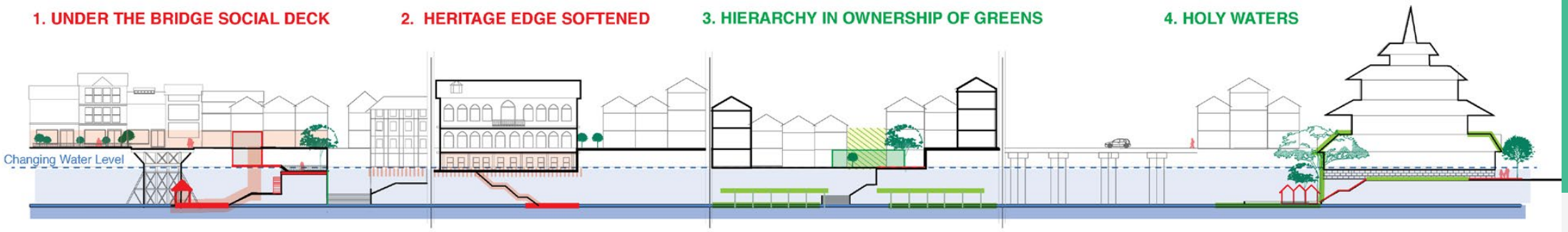


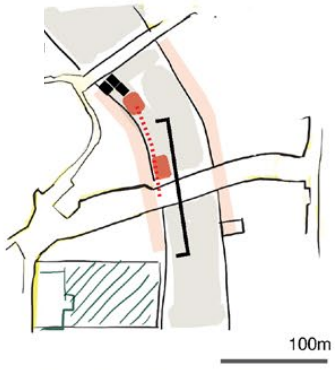


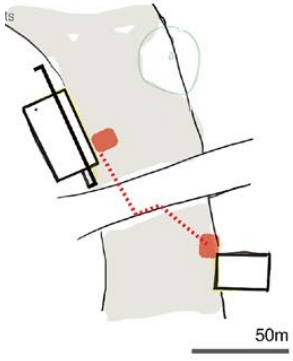
After

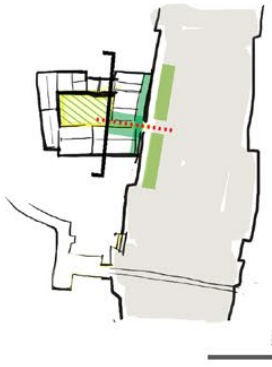


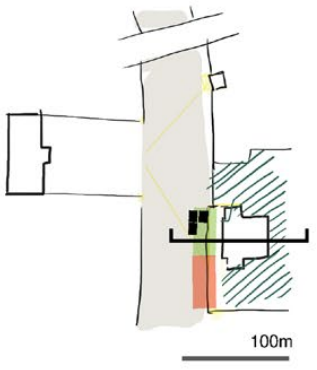
1. UNDER THE BRIDGE SOCIAL DECK
2. HERITAGE EDGE SOFTENED
3. HIERARCHY IN OWNERSHIP OF GREENS
4. HOLY WATERS







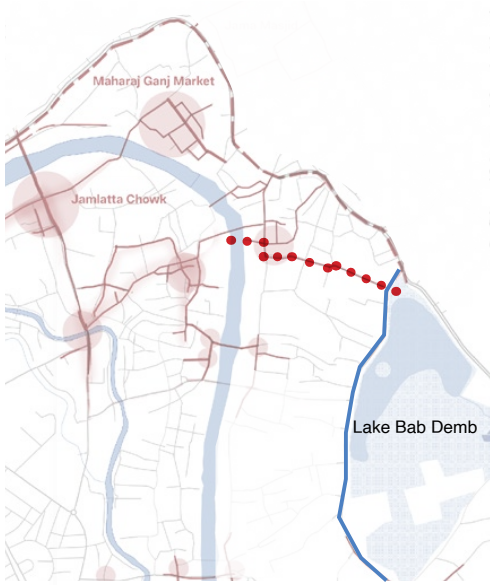




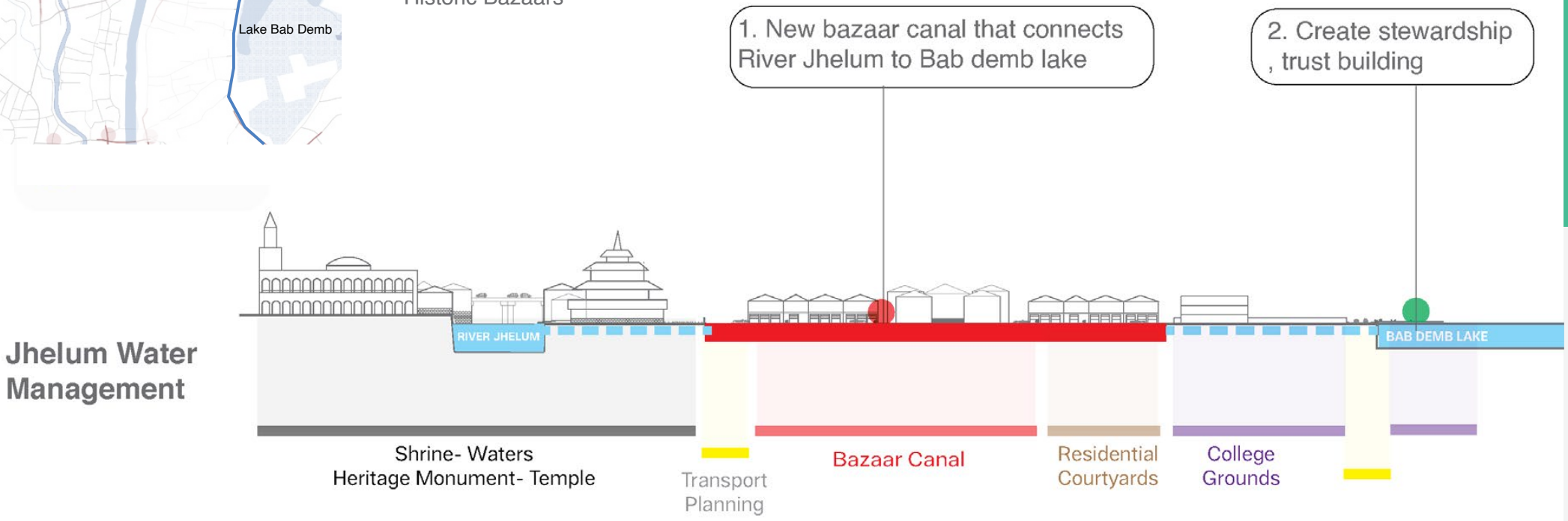
Pilot Theme 2

Bazaar Canal

Governance Section, Pilot



Historic Bazaars



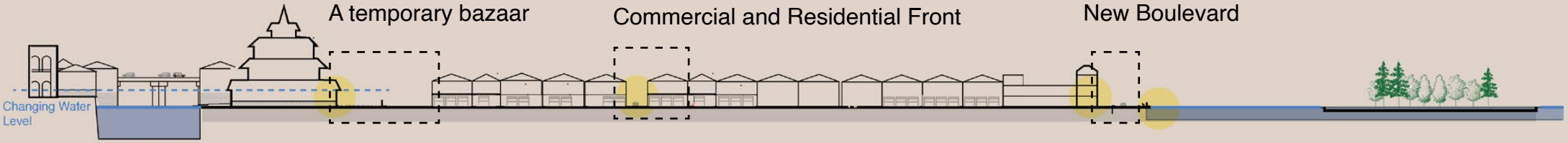
Before

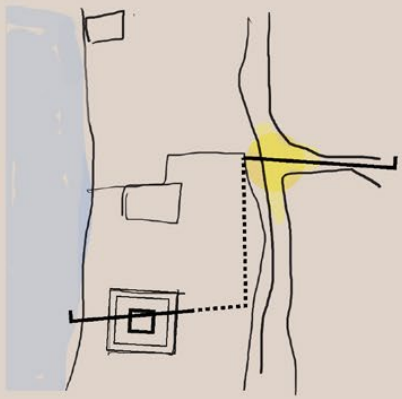

Shrine


Bazaar

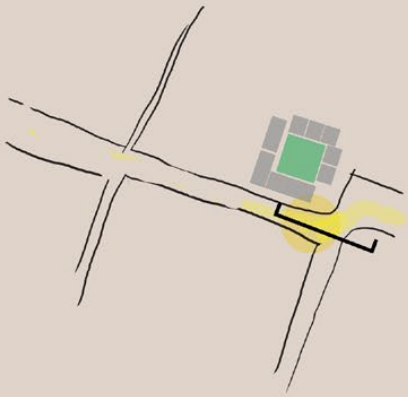

School

New Boulevard

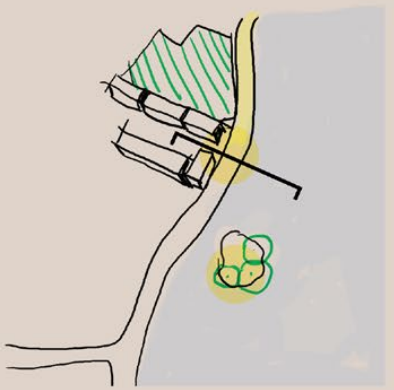



50m

Shrine

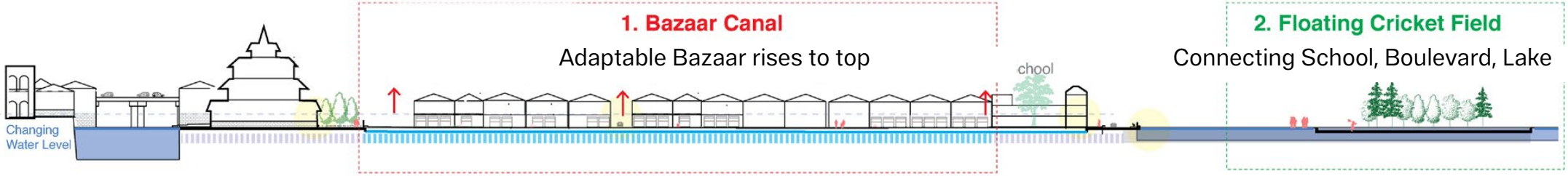

50m

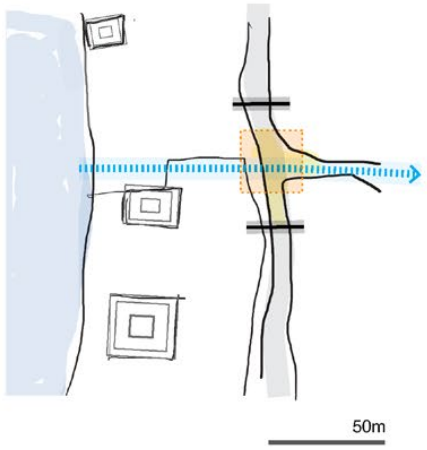
Bazaar


100m

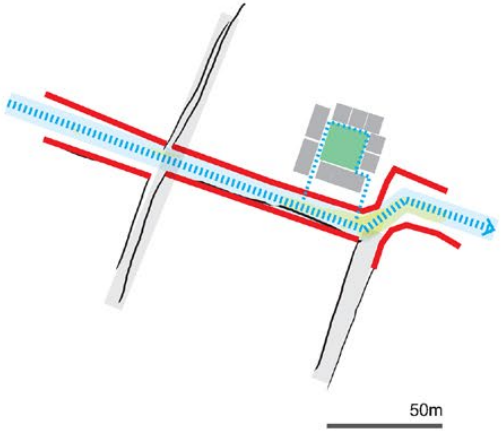
School

After

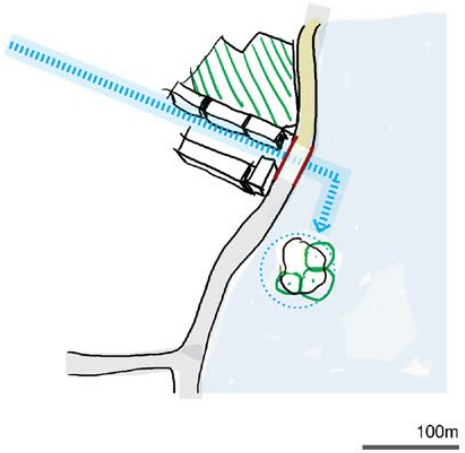




Temporary Market

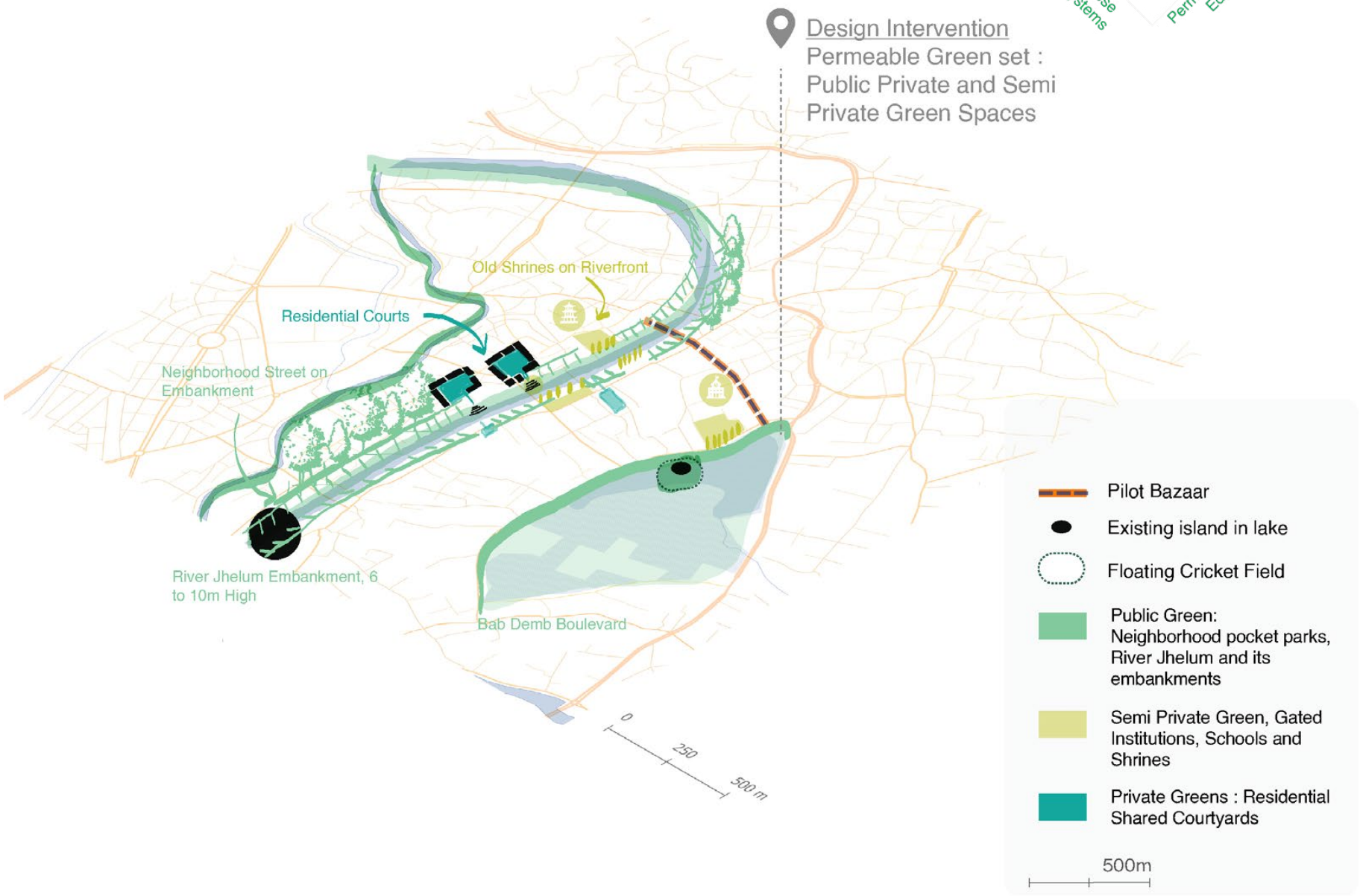


Bazaar Canal



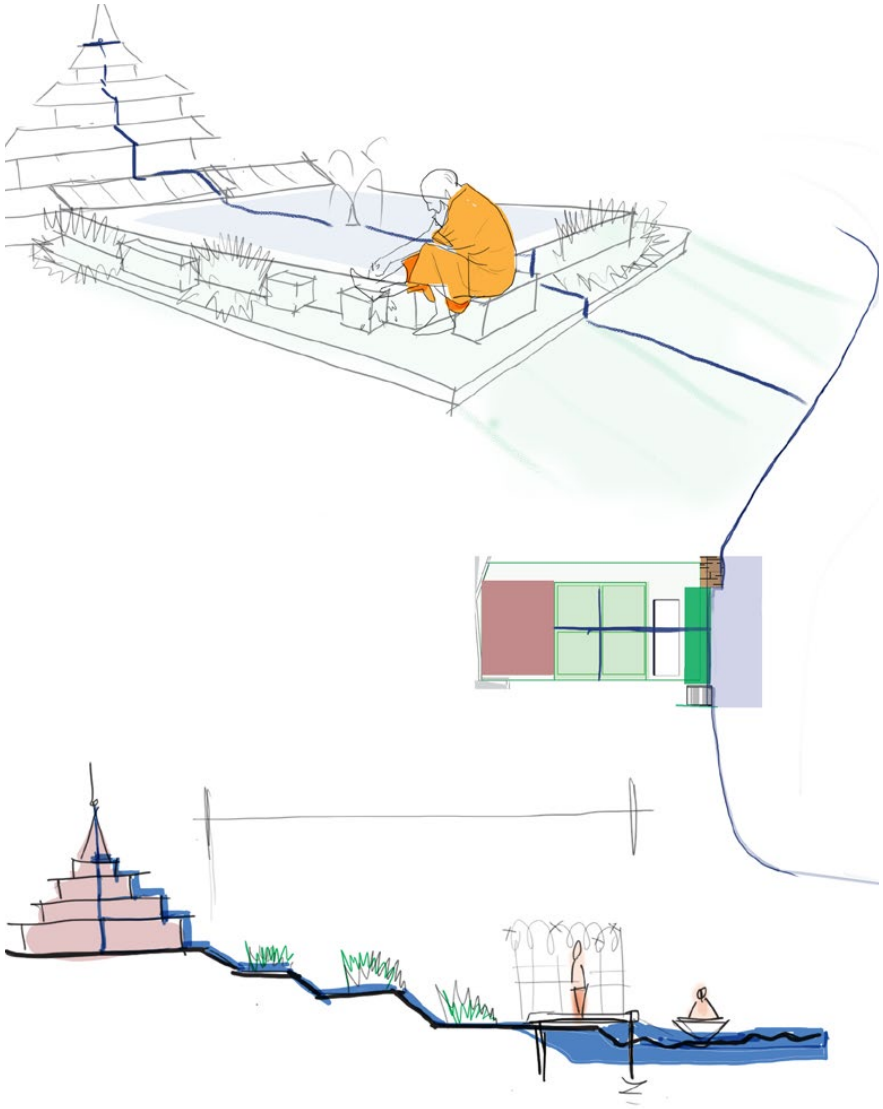
Floating Mini Cricket Field

Pilot Theme 3



Semi Private Green space

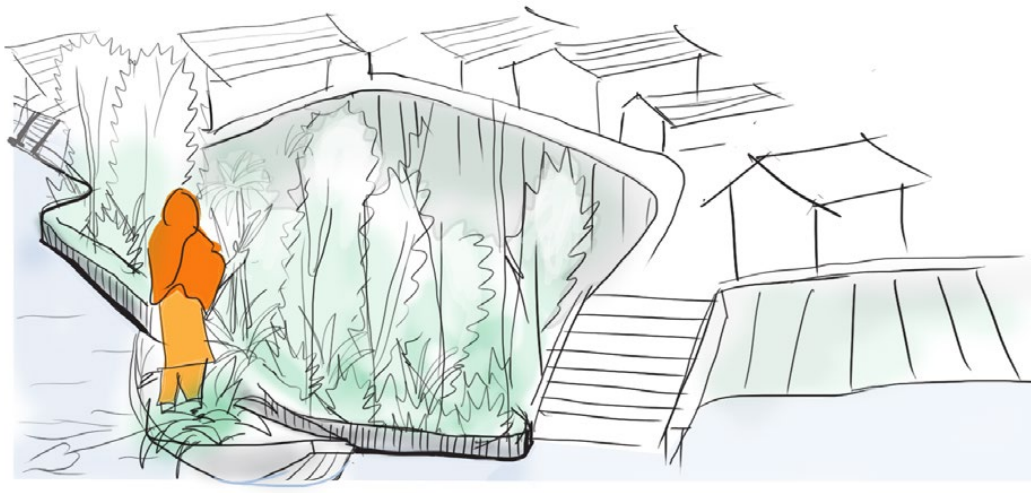
Design Impression



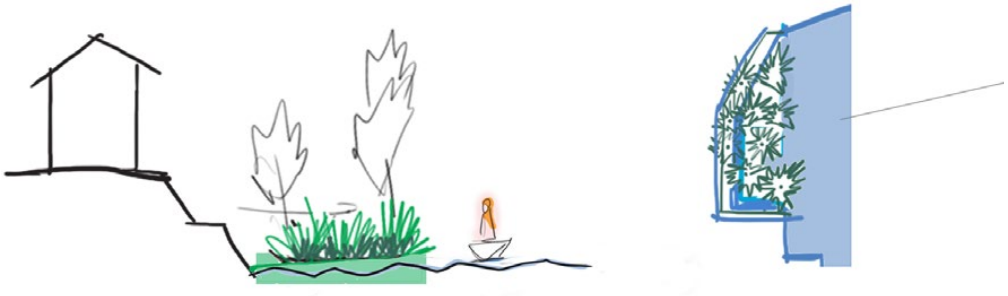
Jhelum waters engage with shrine in a spiritual way in the form of ablution ponds and visually in terraces of Urban Farms.

Example of Private Green Space

Design



Urban Farms managed by the Haenji.
These need regulation and a designated place to prevent haphazard growth.

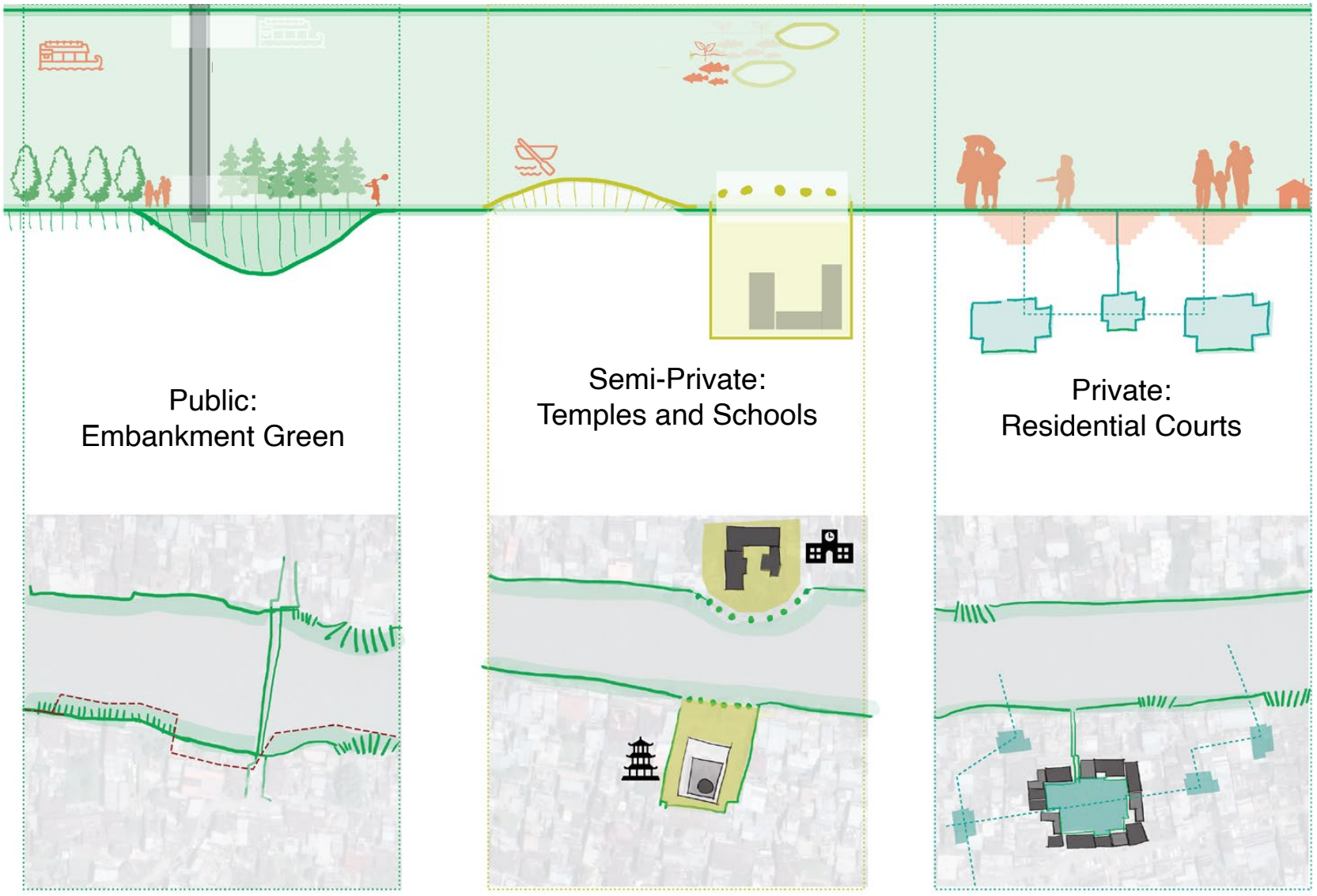


Jhelum Left Bank

Pilot theme 3

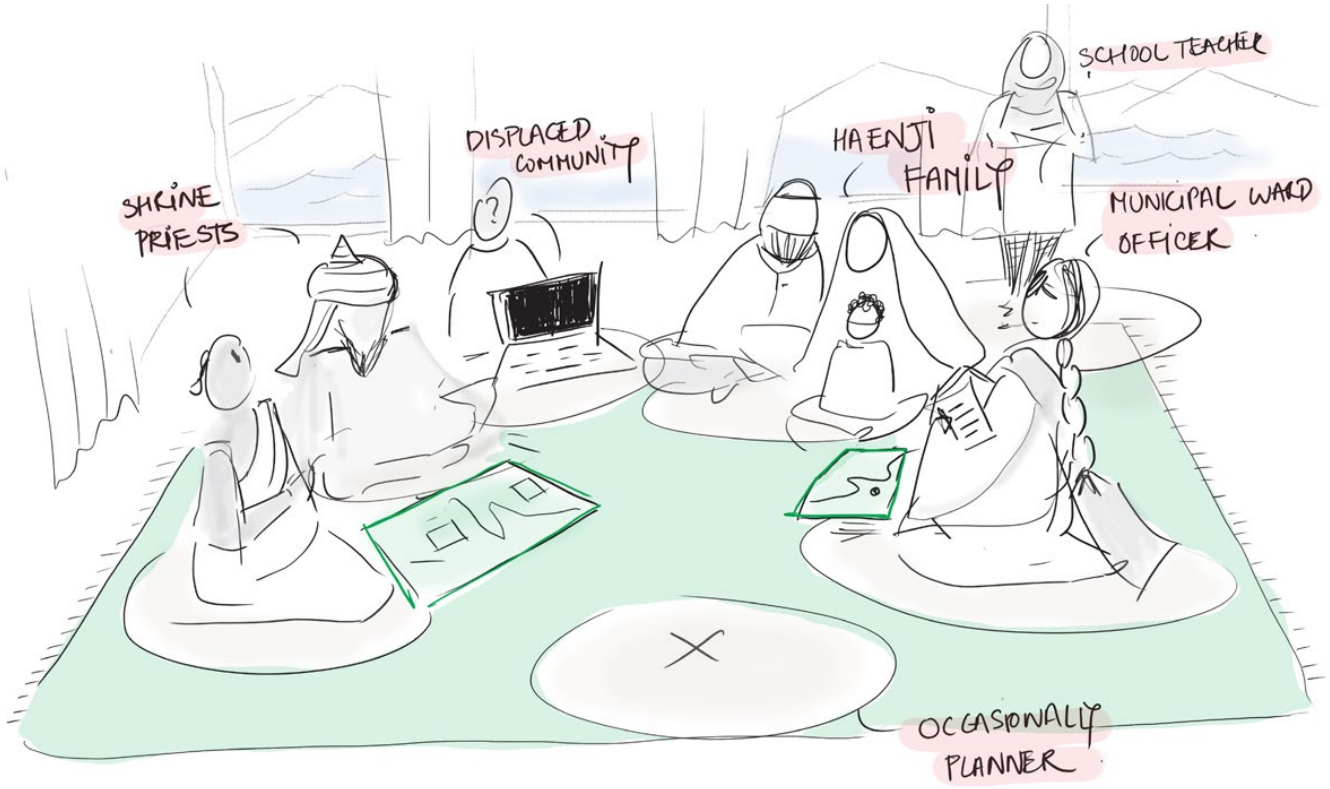
Permeable Left Jhelum

- *A modular set of Green spaces*
- *Ownership Stewardship of Water*



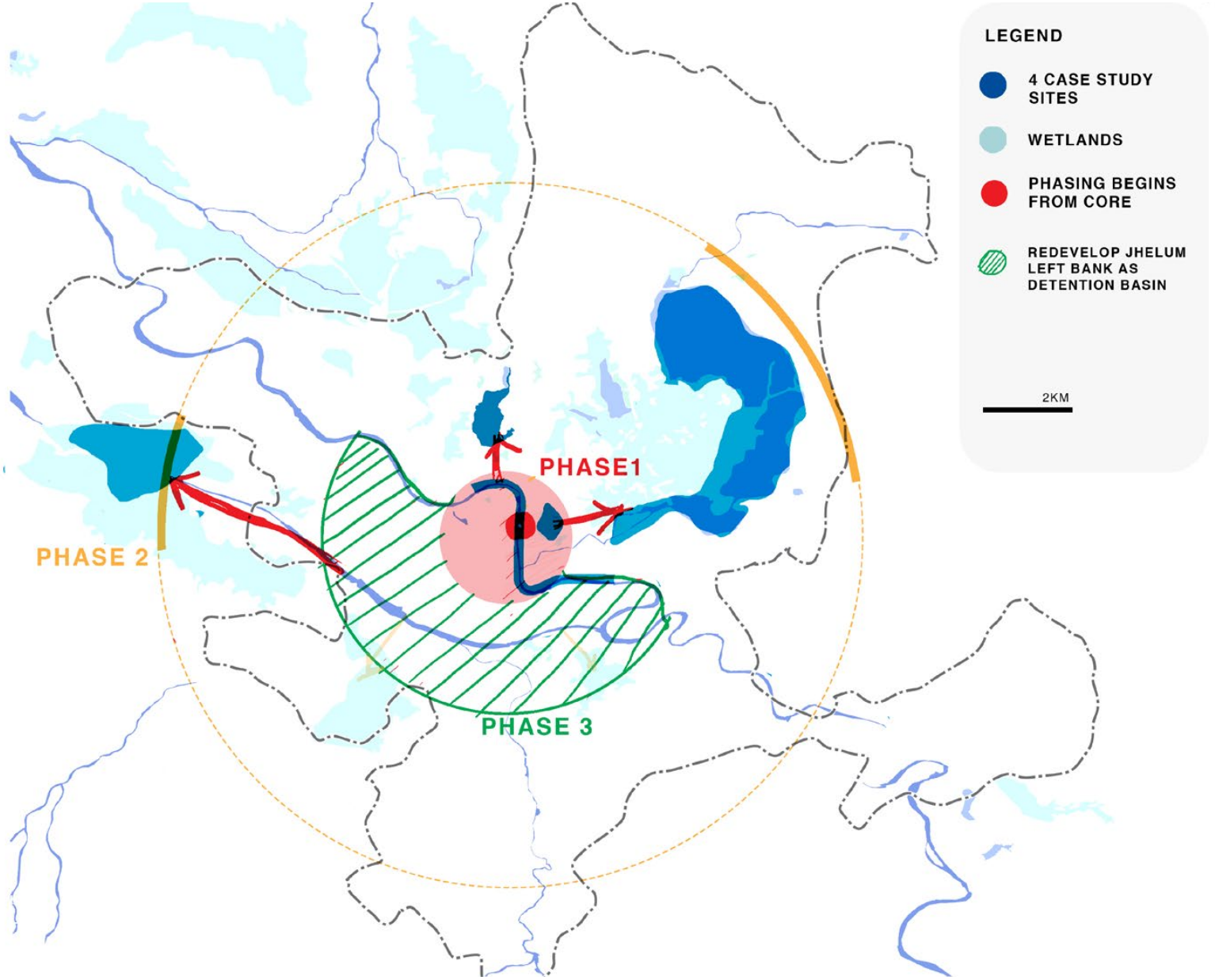
Neighborhood Water Board

Governance Vision

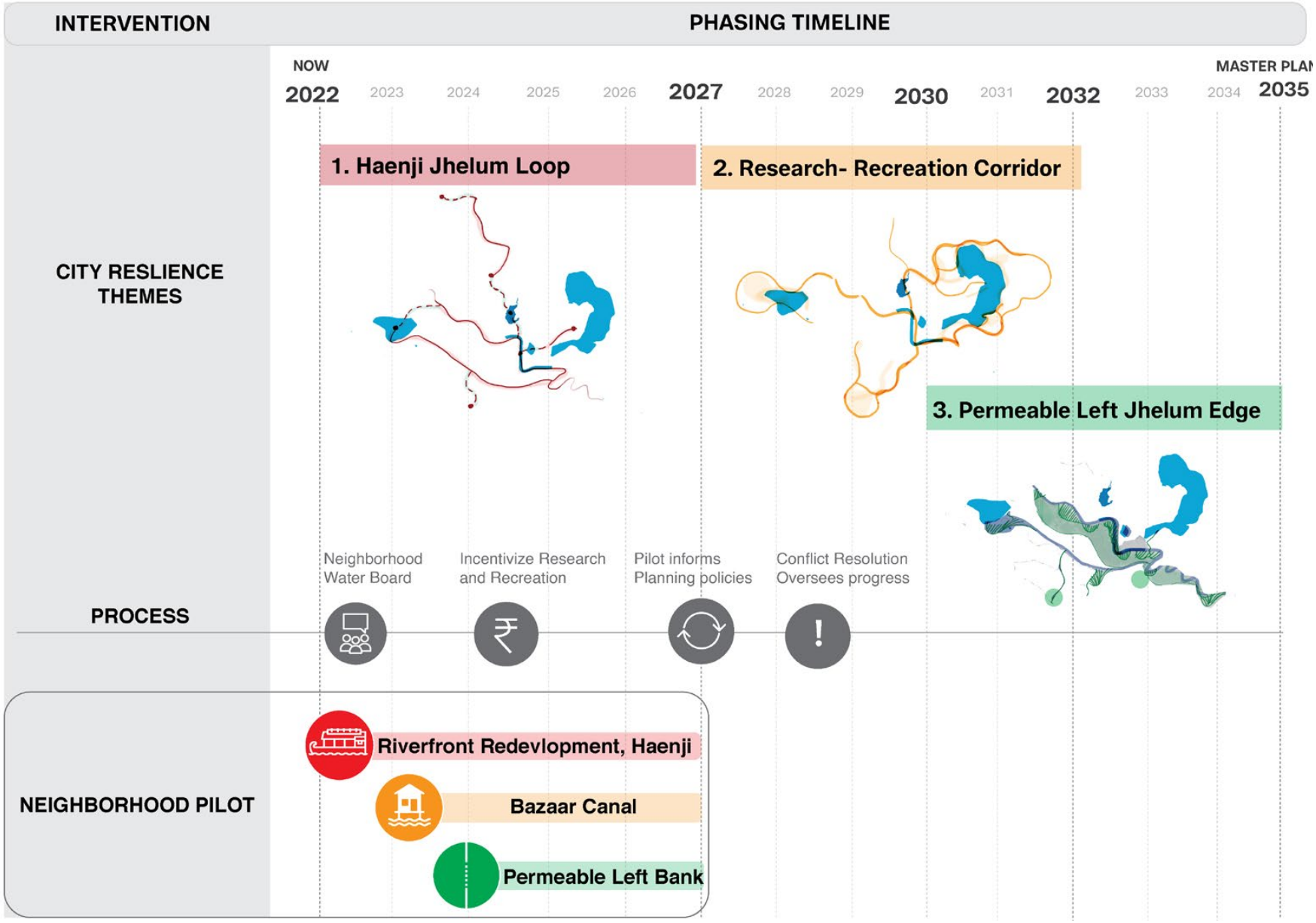


Local Governance Unit

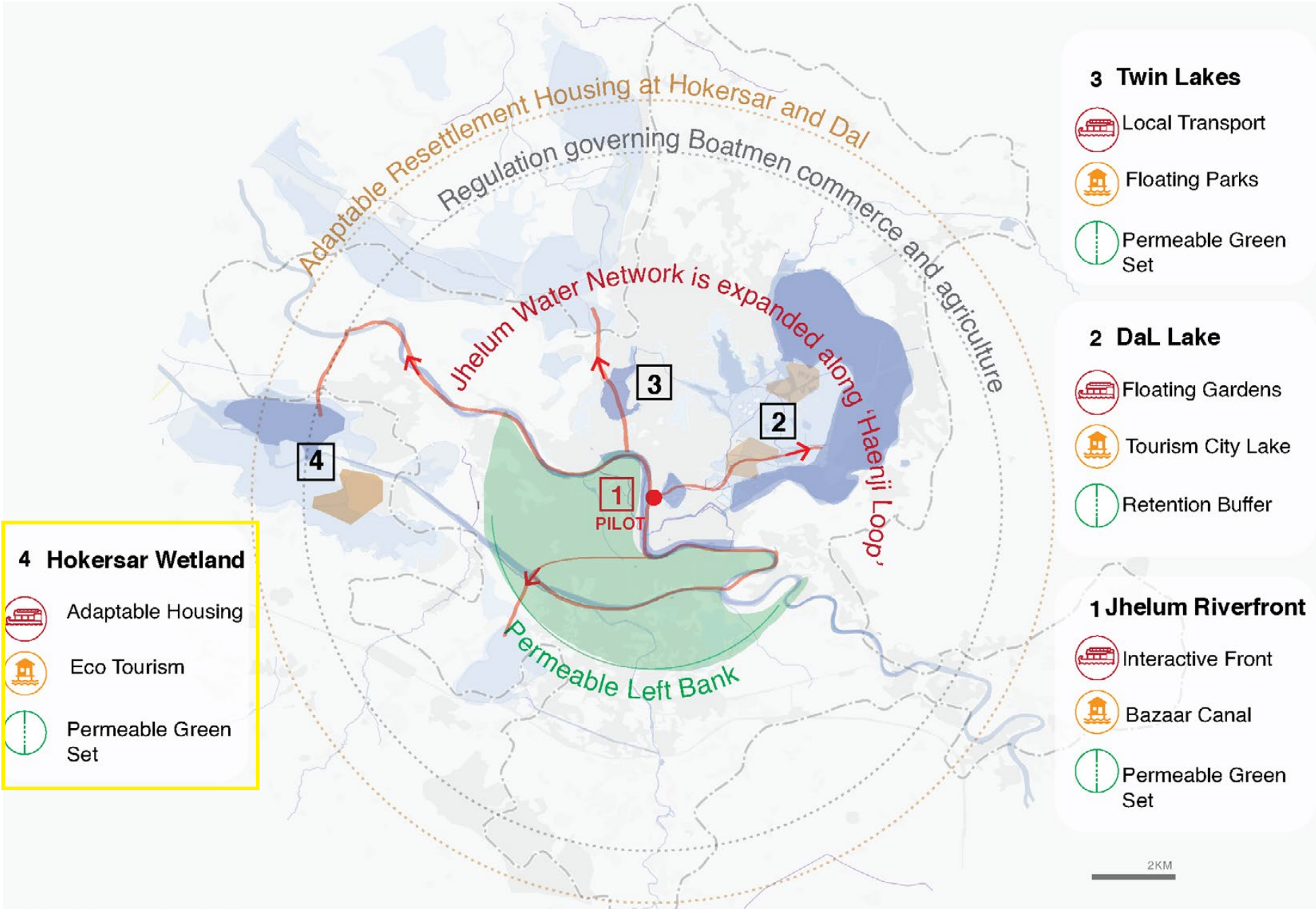
Phasing


LEGEND
4 CASE STUDY SITES
WETLANDS
PHASING BEGINS FROM CORE
REDEVELOP JHELUM LEFT BANK AS DETENTION BASIN
2KM
PHASE1
PHASE 2
PHASE 3

Phasing


INTERVENTION
PHASING TIMELINE
NOW
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
MASTER PLAN
2035
CITY RESLIENCE THEMES
1. Haenji Jhelum Loop
2. Research- Recreation Corridor
3. Permeable Left Jhelum Edge
PROCESS
Neighborhood Water Board
Incentivize Research and Recreation
Pilot informs Planning policies
Conflict Resolution Oversees progress
NEIGHBORHOOD PILOT
Riverfront Redevlopment, Haenji
Bazaar Canal
Permeable Left Bank

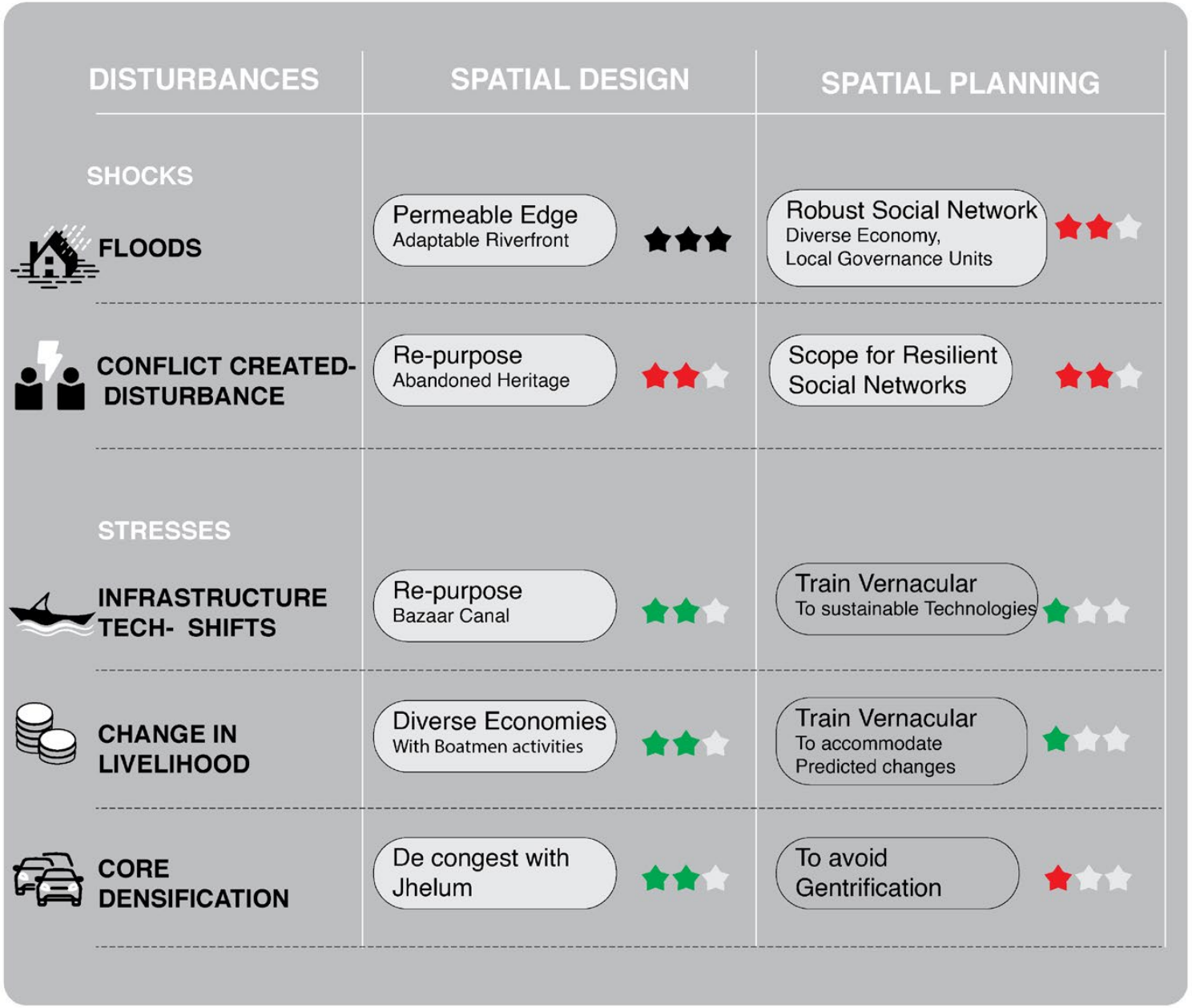
Upscaling Plan



4.Conclusion

Haenji Houseboats and Homes on Dal Lake.

Stress Test I Design Pilot



Manifesto

Building Resilience with
Vernacular Practice

1 Vernacular Water based Livelihoods should be geared towards sustainability

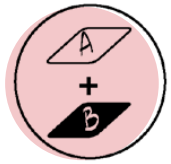
- Locate traditional hydro-social networks in Land use master-plan.
- Revive nature based solutions that could serve as tools to transition to sustainability.

2 Wetland Conservation Plans should make room for uncertainty

Mapping resilience scored on robustness and flexibility in design as well as water governance.

3 Incentivize diversification of river and lakefronts

Allow for heterogeneous composition in land use and even flexible land use policies.



4 Combine Urban agriculture practices with commercial and residential uses

Intensify value of land with other uses to work against mono-cultures.

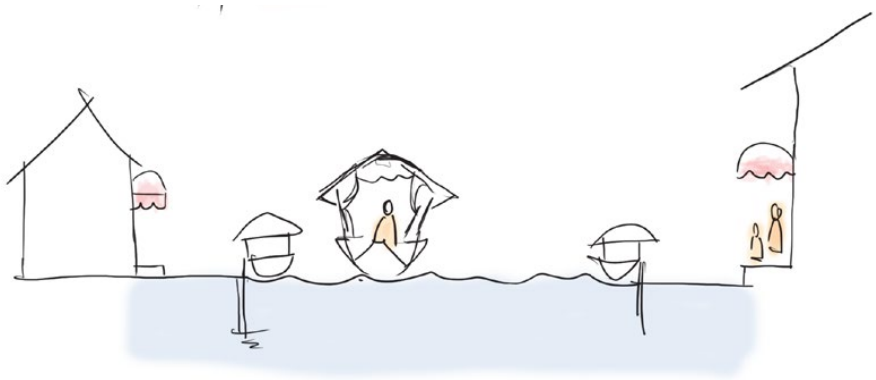
5 Resettlement of water based livelihoods Compensated with advocate led rebuilding

Planners with community advocate re imagine the role of vernacular practices in newly resettled habitats.

Reflection

Product:

- Strategy Toolkit
- City Vision
- Pilot neighborhood
- Stress Test
- Manifesto to guide for future projects



Bazaar Canal, Design of Theme at Pilot

From Theory, Design, Planning to Theory again

Reflection

Alternate Approaches?

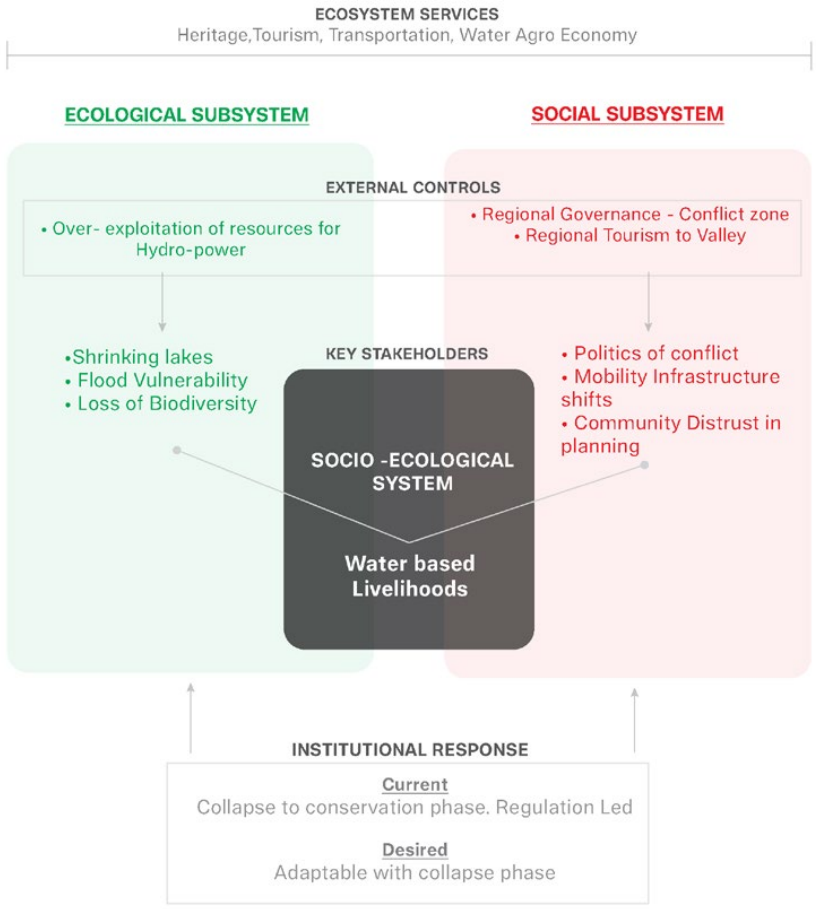
• An alternative approach would be Scenario Based Mapping to changes like

1)Conflict, 2)Floods, 3) Infrastructure Shifts

• Or Testing a theory, Adaptive Spatial Planning

How thesis adds to theory?

Water based livelihoods as middle ground as an asset through this SES Framework



Socio-Ecological Model

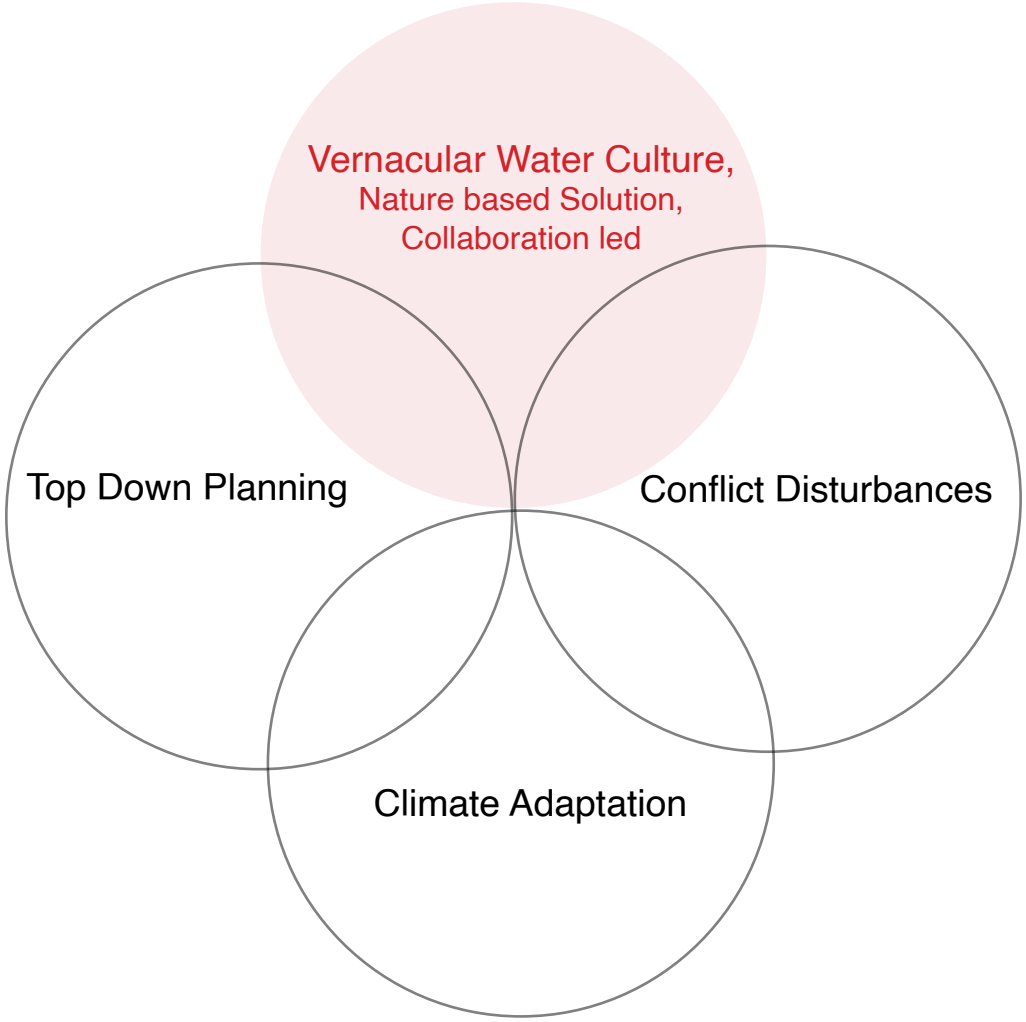
Reflection

Transferability of work

Intersection of these spheres

The case of Assam - Brahmaputra basin.

Image Source: https://edition.cnn.com/2022/05/18/india/assam-india-rain-flooding-intl-hnk/index.html
https://www.re-thinkingthefuture.com/rtf-fresh-perspectives/a1342-the-heritage-architecture-of-assam/



Thank you for Listening